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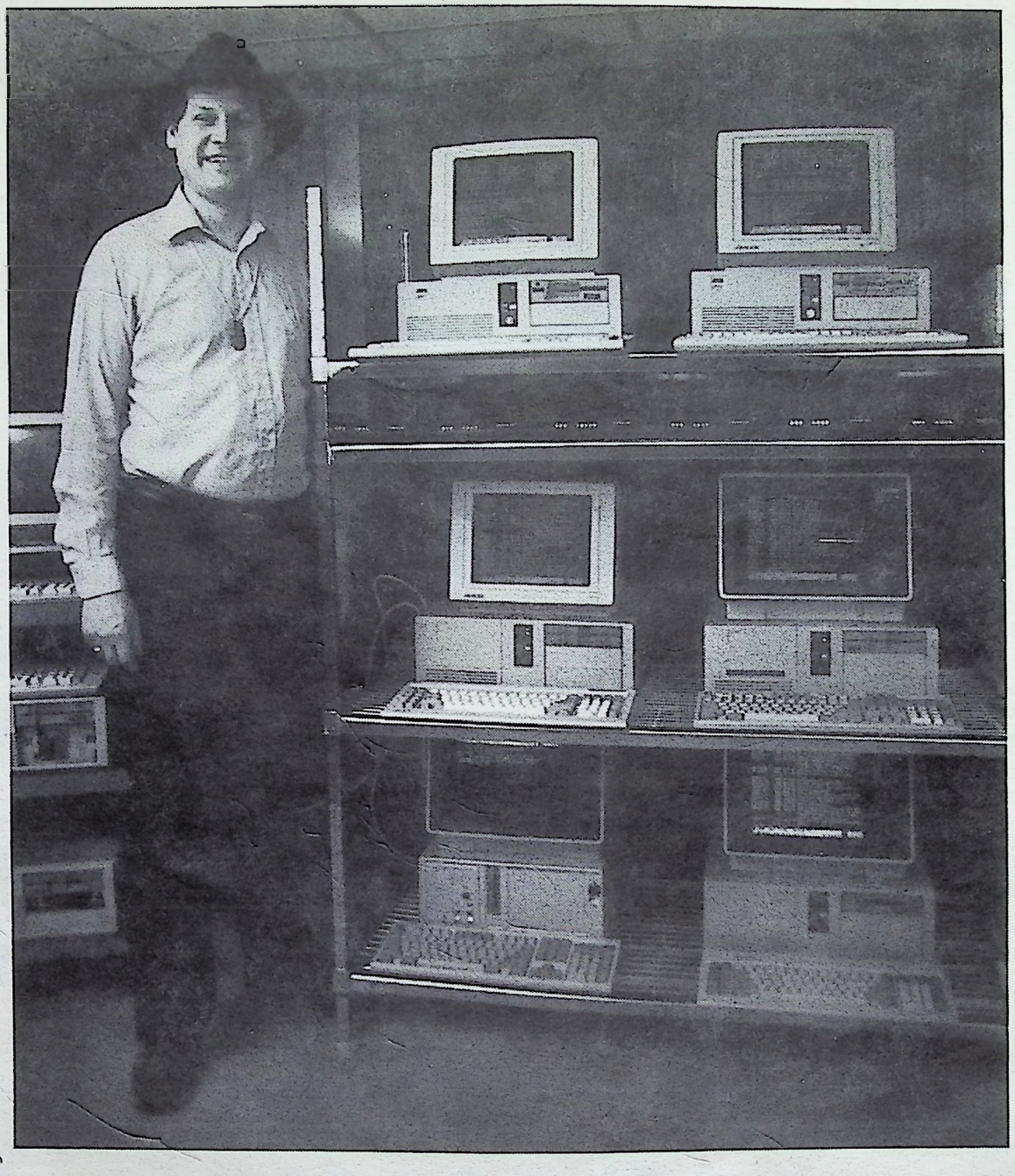
BOARDWATCH MAGAZINE

ELECTRONIC BBS AND ON-LINE INFORMATION SERVICES



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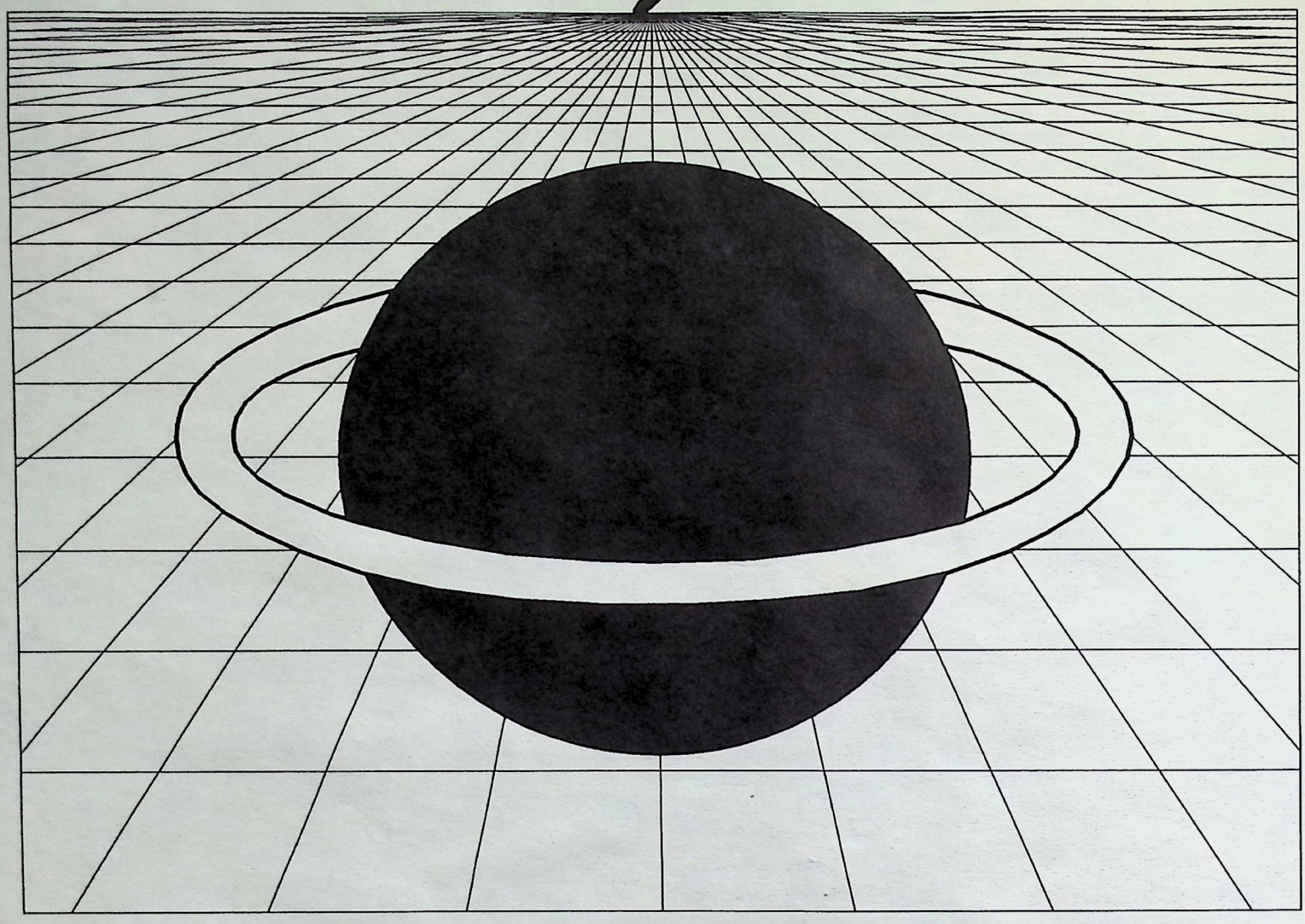

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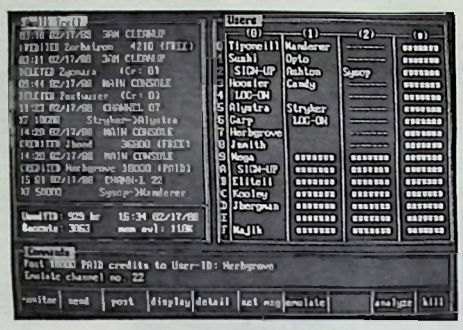
- Boardwatch Magazine -

Which Multi-User BBS Is Best?

The top five DOS-based multi-user Bulletin Board Systems on the market are The Major BBS, TBBS, PC Board, DLX, and WILDCAT! Which one is for you? Here are some facts to help you decide.

All of these BBS designs offer E-Mail, file upload/download, teleconferencing, security controlled access to various configurable message and file bases, and so on. Each comes with professional documentation, telephone support, and a set of easy-to-use configuration and maintenance utilities.



The Major BBS: multi-user E-Mail, file upload & download, teleconferencing, message bases, plus!

The Major BBS, TBBS, and DLX all support multiple simultaneous users on a single desktop computer running standard MS-DOS version 3.0 or higher. PC Board and WILDCAT! require a separate computer for each user, with the computers connected together via LAN, unless you plan to use a DOS-overlay multi-tasking executive such as DESQview or DoubleDOS.

As of this writing, The Major BBS supports up to 64 simultaneous users, TBBS supports up to 32, and DLX supports up to 24. In each case, specialized multi-port hardware is needed to support 6 or more users, but standard COM ports can be used for smaller systems. The Major BBS is the only one that can support 4 standard internal COM1, COM2, COM3, and COM4 modem or serial cards simultaneously. The others allow you to use two out of these four, but to use more than two COM ports they require that you buy multi-port cards.

The Major BBS is also the only one with source code available. If TBBS, DLX, PC Board, or WILDCAT! do not do what you want, you cannot modify their source code to make them do it. The C source to The Major BBS is compatible with both Turbo C and Microsoft C. It is clean and well-documented. Steve Gibson calls our source code "a software system of uncommon beauty and grace" (*INFO WORLD*, 7/31/89).

WILDCAT! and PC Board offer "doors", which permit the Sysop to add large amounts of software developed by third parties. The Major BBS, TBBS, and DLX do not offer "doors", but The Major BBS permits the integration of hundreds of add-on software products developed by third parties, at the C source code level. Add-on products available include databases, marketing tools, multi-player adventure games, dial-out utilities, and more.

The Major BBS is the only one to support true protected mode operation. The other leading BBS's are strictly real mode products, so they are limited by the one-megabyte address space native to the 8088. "Expanded" memory (EMS) is an awkward way of getting around this 8088 limitation. With The Major BBS source and the Eclipse/Ergo DOS extender, you can address up to 15 megabytes of true "extended" memory on a 286, 386, or 486—without changing operating systems.

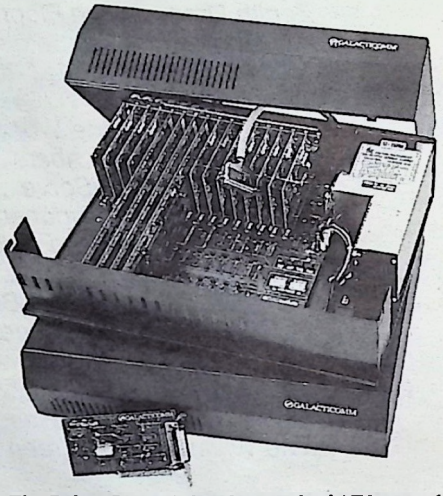
The Major BBS is the only one of the leading five to offer optional X.25 direct-connect to packet-switch networks. The others can be connected to an X.25 network through a PAD, which typically costs over $1000 per month in leasing charges, or via LAN gateways. The Major BBS with the X.25 software option talks directly to the PC XNet adapter from OST, Inc. This both improves performance and dramatically reduces cost.

Galacticomm is also unique among the five main BBS vendors in that we have solved the hardware problem of interfacing more than 32 ports to one computer. The Major BBS works both with standard COMx serial ports and modems, and with our high-capacity hardware. You can use any standard PC, XT, AT, 386, or 486 with any of our hardware products. The rising star of our hardware lineup is the GalactiBox, a 16-slot chassis which can be populated with standard 8-bit serial or modem cards at rates up to 38400 bps, to create systems that will be state-of-the-art well into the 21st century.

The Major BBS is the system you saw on the cover of the March 1990 issue of *Personal Computing*, with the caption "This Man Saved His Department $100,000". If you have dialed into the Tech Support BBS lines at Ashton Tate, AST Research, Central Point Software, or Natural Microsystems, you have used The Major BBS. Our customers include the U.S. Army, Navy, and Air Force, ten major universities, and computer industry giants such as Epson America, Autodesk, and UNISYS.

We offer inexpensive, flexible, expandable software starting at $59 for a 2-line Standard Edition. You can double the number of lines (simultaneous users) supported from that point, to 4, 8, 16, 32, or 64, for a flat $300 per doubling. The C source license to the Standard Edition is a flat $285 extra, independent of line count. Four extended editions are available: the File Library Edition (add $149 for executable license, add another $129 for the C source extensions), the Shopping Mall Edition ($249/$189), the Entertainment Edition ($149/$129), and the MenuMan Edition ($149/$129). Call for prices on hardware, the X.25 software option, our annual update service, and protected-mode toolkits.

Please call 305-583-7808 with your modem (8-N-1) for a sample of what we offer. Or, call our sister company Galactic Innovations (BBS #305-321-2410, 8-N-1) for a look at some of the add-on software available, including The Major Database and several multi-player real-time games.



The GalactiBox: 16 slots for standard AT-bus cards such as serial ports, fax, voice I/O, and modems

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EDITOR'S NOTES

THE IGNORANCE OF THE LAW IS NO EXCUSE - BUT IT IS FRIGHTENING.

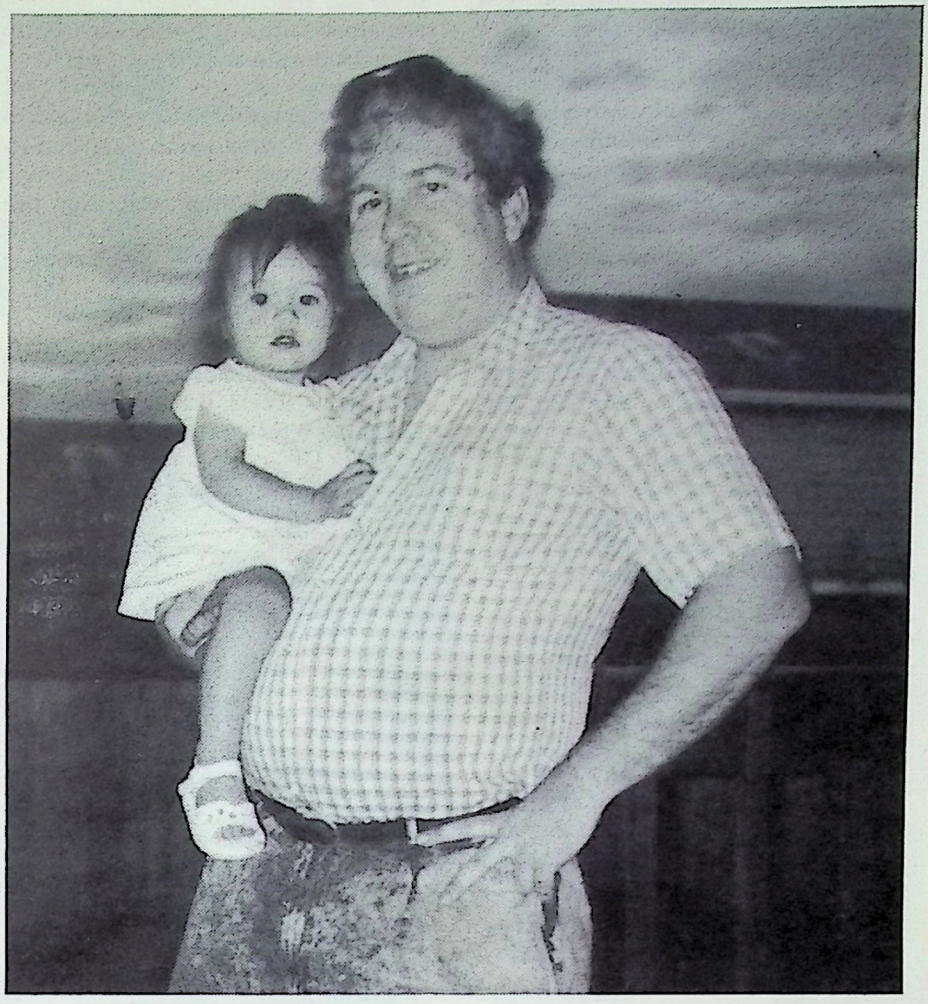
In looking over the current issue as it shapes up, it would seem legal matters have taken a good portion of our space. That is unfortunate, but let's go with the flow.

The Secret Service's Operation Sun Devil is shaping up to be a monster. Everyone would like this story to be about an efficient, courteous, alert group of our nation's best homing in on the few online miscreants that make life miserable for all of us and eliminating them from the scene with efficiency, justice, fairness, and clearly defined purpose.

It is alarming, then, viewing the reality of a group of grossly misinformed thugs randomly bashing in doors, threatening families with young children at gunpoint, and raging around BBS land in a crazed witch hunt with little purpose and less informed understanding than could normally be expected of a barnyard full of chickens after the outhouse blew up. The tales of governmental ignorance of matters online making the rounds are reaching epidemic proportions and threatening to start an online mythology of its own.

Attempts to read laser printer ribbons, transmit actual chip hardware over the wires, and tie industry leaders such as AutoDesk and Mitch Kapor of Lotus 1-2-3 into a conspiracy of hackers is mirthfully comical. When they mistakenly bash in your door, seize your equipment and all data backups, and put you out of business for three or four months and subsequently into bankruptcy based on this type of raging stupidity, try to retain that sense of humor.

The implication that this juggernaut of the intellectually damned was launched at the behest of Apple Computer and various telephone company entities is a bit darker. If we can fan this online paranoia a bit higher, any company with a large enough organization to convince our boys in blue that they are one of the



"good guys" can strike a death blow by pointing the crazed beast at anyone not serving their interest. By the time someone pulls a reality check on the situation, the intended damage will be done.

The Lotus/PaperBack Software lawsuit is a bit more problematical. In the past, the conventional wisdom has been actual software program source code enjoyed copyright law protection, but the function and presentation did not. U.S. District Court Judge Robert Keeton threw this view into question by ruling the presentation is protected as well. The 110 page ruling also made clear that computer "languages" are copyrightable as well. This could have an impact on Ashton-Tate's current lawsuit against Fox Software regarding the dBASE programming language.

It would be easy to jump on the bandwagon and claim that the man has no understanding of "our industry" and has thrown a legal monkey wrench into software development, crippling innovation in software forevermore. OK. But these people wrangled over this one lawsuit for at least three years. If he didn't know anything about it starting out, we've got to assume he learned something along the way. Assuming so for the moment, what is the real line of thought behind this ruling?

Copyright laws are conventionally thought of as covering books, magazines, and other print publications. As technology evolved, it grew to cover audio recordings, movies, and computer software.

In print media, the copyright covers the presentation of text. If you buy a book, what you derive is a view of words on a page. The words act together toward an end, conveying ideas and a story to the reader. The original notes, typesetting marks, and printing techniques used to produce the end product are of little interest vis a vis copyright protection.

Likewise phonograph records and other sound recordings. Regardless of how the sound levels were mixed, what media it was stored on as a master, and what intermediate steps were taken, the sound that reaches the listeners ear is the protected item. It is specifically the thing purchased and perceived by the buyer.

In films, it doesn't matter what was cut, what was kept, who's scene was dropped, or what type of camera and film was used to produce it, the visual presentation of the film is the thing protected. It's what the viewer pays to see. The actual written script, while usually separately protected by earlier registrations in book or written form, is not even in itself a factor in the copyright protection afforded the film.

How then, did we ever come to view software as protected in the source code, which the user NEVER sees, while unprotected in the on-screen presentation, menus, graphics, and command sequences they DO actually see, use, and indeed pay for? For 99% of the purchasers of Lotus 1-2-3, if they DID ever actually see the source code for the program, they wouldn't be able to tell if it was the source code for Lotus 1-2-3 or directions in Cebuano on how to roast a pig.

The question goes directly to whose ox got gored. If you are Lotus, half a dozen software programs are out there trying to compete with YOU using the interface and presentation YOU developed and access the market you created. If you market a competing program, or use a cheaper version, it would seem Lotus's avarice knows no bounds. They want a hammer lock on the whole spreadsheet concept.

Lotus did not invent spreadsheets anymore than Louis L'Amour invented the Western novel. They never claimed to. Louis L'Amour depicted scenes in several of his books of the lone horseman riding across the plains. So did Zane Grey before him. A work is often built on concepts introduced by preceding works. You can't copyright the concept of a lone horseman on the plains. In fact, you can't copyright concepts. But you can protect the words used to depict them. Lotus asserts the specific command sequences used to activate certain functions, and the specific screen depictions and functions resulting, together as a group form a unique work. Inescapably, we must concur. Judge Keeton, it would seem, did too. Individual command elements do NOT gain protection and Judge Keeton made clear that the slash (/) key command used by Lotus is NOT protected in itself. Many programs use ALT-X, or example, or ESC, to escape the program. These conventions are not threatened at all.

At some level, the question becomes a matter of degree. For those not familiar with spreadsheets, we would note VP-Planner, as well as a number of others, blatantly DID copy Lotus 1-2-3's entire interface and presentation and brazenly advertised to the world they had done so - wrongfully assuming it simply wasn't protected by copyright law and they did have the right to do so. They didn't use similar concepts; you could actually run the same macros (a stored series of key strokes to perform repetitive functions) on the clone programs you used on Lotus 1-2-3 and they would work. They actually touted the fact in their promotional copy!

The canned chant is there are only a certain number of keys on the keyboard and protecting command sequences is impossible. In response, we would note there are a lot more keys on the keyboard than numbers, letters, and punctuation marks in the alphabet but that hasn't quite served as a restriction sufficient to prevent the creation of War and Peace. Most sentences end in a period and that's hardly protected - it's an accepted convention.

The other concern is that software buyers will be forced to learn a new interface every time they want to change programs. Well perhaps the user doesn't WANT to change and that is part of the value in owning the rights to Lotus 1-2-3. On the other hand, to woo those users, perhaps another developer will produce a better, more usable interface. With everyone copying Lotus, there's pathetically little effort toward that now.

In the long run, we don't think it will stifle software development. It should promote it. If you can come up with a program, presentation, and interface unique and desirable, it becomes a marketable commodity and your rights in it are much more secure than was previously the case. If it looks like your software, it should be your software.

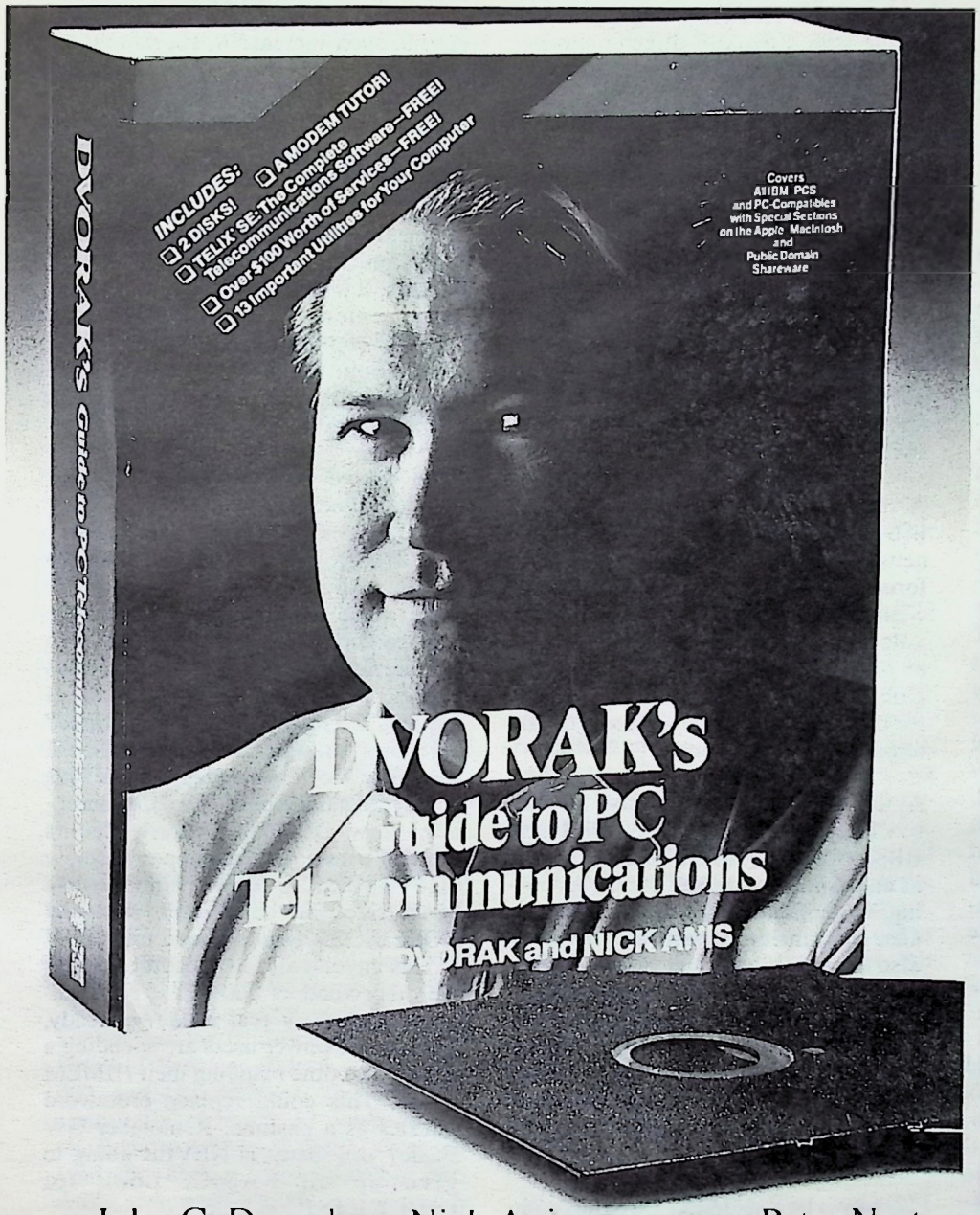
Lotus's immediate lawsuits against SCO and Borland appear vicious on the face of it. We happen to prefer Borland's Quattro Pro spreadsheet ourselves and I personally admire the whole Borland product line and culture. Lotus on the other hand appears very corporate and so largely anathema to us. But in our estimation, Quattro Pro doesn't look very much like Lotus 1-2-3 anyway. They offer an optional interface advertised as Lotus compatible. It wouldn't tarnish our preference for Quattro if they removed the Lotus interface altogether. We expect Borland to reach a settlement with Lotus essentially agreeing to do so, rather than fight a protracted legal battle over a fairly small element of their program. Undoubtedly they will lose a bit of market share to Lotus as a result, but the setback should be brief. Quattro is just as good a spreadsheet and at $99.95 it's a fraction of the price. The interface is fine and the program does a better job managing memory.

The standard closing argument is that in the end, it will be the user that loses. This is self serving pap intended to cause you to sympathetically identify your interests with those who have a fiscal ax to grind. There is so little standardization now between word processors, database programs, etc. that the argument that the user will be the loser when there are no standard interfaces is specious. We haven't lost it because we never had it - with the singular exception of spreadsheet clones of Lotus 1-2-3.

In the end, the conventions and laws protecting rights to written, recorded, and filmed works have been extended pretty much intact to include software in a very consistent fashion. Software development has in a sense been recognized and absorbed into our cultural and legal body politic - in a way, validated and accepted. This was only possible after the paradigm of a salable software program on a personal computer matured and some degree of familiarity emerged among a significant portion of our population.

Wise Guide.

Dvorak's Guide to PC Telecommunications



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Unfortunately, this same maturation has NOT occurred in the online world. The segment of our population familiar with the conventions that HAVE emerged in that area remains discouragingly small. This unfamiliarity leads directly to the type of problems we see emerging from the Operation Sun Devil fiasco. We rather anxiously await the day when the online world is likewise familiar to and validated and accepted by our society - at least to the point of extending the freedoms "guaranteed" by the Constitution of these United States to the "virtual" world online.

TELEBITS

TELECOM TRAPPERS RENDEZVOUS

Dave Hughes is a madman. Long-time readers of Boardwatch will note our ongoing fascination with this Colorado Springs-based unabashed promoter of all things online. A retired West Point instructor and career army man, Dave discovered online communications in the late seventies while working on a project to revitalize an old downtown area of Colorado Springs Colorado. In the twelve years since, he's been at hand for virtually every significant development in online technology. He established the concept of user publishing during the early days of THE SOURCE. He's forged online links to the Soviet Union, Dailan China, and helped the state of Montanna establish a telecommunications online network for rural schools called **Big Sky Telegraph** operating quite publicly at **(406)683-7680.** He operates his own **Old Colorado City Communications** system at **(719)632-4111** and is widely regarded as the poet laureate of the online community. Despite his ongoing allegiance to Unix (boo - hiss), we love him. But he is nonetheless clearly and unequivocally mad as a hatter.

His latest exploit in the online world involves plans for a **Telecom Trapper's Rendezvous** to be held in Cody Wyoming **June 18-22, 1991.** With his usual rural/populist vision, Mr. Hughes has oft expressed his wish for telecommunications to link the ends of the earth. So, he's helping to organize a telecommunications conference at one of them.

In a June meeting of conference organizers, Hughes and cohorts set the conference date and site firsthand. Registration will be a modest **$100** but does not include lodging or meals. Actually Cody is a fairly good site for the conference. Located about 50 miles from Yellowstone, the area is replete with very scenic lodges, cabins, and all the attendant trappings required to service a large tourism industry. A nearby Buffalo Bill Historical Center is completing a $7 million expansion and offers one of the top Western Art collections in the world. It also features a huge gun collection with a dBASE directory to locate specific models in the building. Trail rides, rafting on the Shoshone river, and a nightly rodeo scheduled for the same time will make this a pretty fair vacation spot for those family members not likewise fascinated with little boxes that blink in the night.

The Irma Hotel in downtown Cody, for example, was built in 1906 by Buffalo Bill himself for his daughter. Age notwithstanding, the hotel features plenty of modular jacks and the area is currently upgrading to digital central office switches.

A regular two-hour morning session will present different aspects of global networking. Afternoons will offer less formal sessions. Virtually any registrant wishing to display a new concept, technology, or toy can do so for a full hour at the Continuous Cursor Bonfire. A global hookup "event" will be planned for each evening and some form of entertainment is envisioned.

At the planning meeting, Dave and his son installed a system titled **BigHorn BBS** in Cody at **(307)587-2510** to serve as an information center for the gathering. Lester Santos, a professional musician and sometimes carpenter who has also gotten caught up in the online world, will operate the system. A Rendezvous Fidonet Echomail conference is planned for interested system operators worldwide to carry on their systems discussing details. The service will carry information on lodging and area highlights.

So why is he a madman? Dave has commissioned a Colorado Springs saddlery to make him a saddle for the occasion. This one will feature a 2-inch LCD in the horn, keyboard on the pommel, and electronics for an IBM compatible with packet radio in the saddle bags. An antenna in the stirrups. That's right, Dave will be there riding the range - online.

RUMORS, MIGHT BE'S AND NUMBERS CAUGHT IN PASSING

ProComm Plus fans. The good news: look for a new version **2.0** release by year's end featuring an internal **ZMODEM** protocol. The bad news: during the third week of June, DataStorm notified its retail distributors of a price increase from **$99** to **$119** - the second such increase in six months on the same version of the program. Why is the price climbing? The product has no real competition at retail. The market is finally savvying up that Crosstalk is NOT a contender in communications software. Further speculation by industry insiders is that DataStorm is incurring significant development costs in version 2.0 and their **HotWire** disk management product hasn't sold enough copies to worry with. Wild speculation? Look for a commercially packaged **QModem** version to begin appearing on shelves.

DOS 5.0 very near. What will it do? Most of it goes up into the high memory region above 640K. This regains over **40K** from your DOS area the el hoggo of operating systems 4.01 required. The shell is also down around 1K from the 3.5K required in 4.01 and is reported to operate much faster. DOS 5.0 retains the ability to partition disk drives as large as 2 Gigabytes. Notice a trend? Windows uses a lot of this HIMEM area. Lot's of LAN adapters use this area - LANtastic uses 32K of high memory. Now DOS 5.0. Quarterdeck's QEMM uses a bit. We happen to know that HIMEM is forever limited to a 384K size and your video card and ROM BIOS take up a good amount of it. Has anyone told Microsoft or any of the other vendors that this is NOT unlimited memory real estate? Already, most of the power users are spending a good bit of time mapping their HIMEM usage. This could replace crossword puzzles as a pastime. Remember GW Basic? Bill Gates is NEVER going to give up on BASIC. Look for **QUICKBASIC** in DOS 5.0.

General Electric Information Services is now claiming **203,000** individual subscribers on their **GEnie** online service. The service has roughly doubled in size in the past two years making it arguably the fastest growing clock charge service in the country. Low pricing could be the key.

Moscow and Albania are now direct dial from the U.S. Dial 011 for long distance plus country code 7 and city code 95 plus the number. The rest of U.S.S.R.? Nyet.

Are toll-free **800** lines popular? Americans made over **9 billion** toll free calls last year - an average of one toll free call each 11 days for every man, woman, and child in the nation.

Chrysler Corporation is introducing a cellular telephone on their 1990 sedans. The phone is manufactured by Cartell and its built into the drivers side visor. The option will be available at **$980.**

Southwestern Bell has announced operation of an online directory assistance service providing name, address, and telephone numbers for all 15 area codes served by the company. The service is titled **DirectLine Custom.** Incredibly, the company requires a **$4182** initiation fee, **$8.80** per month to keep your password active, and **9.3** cents per screen for the data. All the RBOC have been encouraging data providers to go online via relatively inexpensive **976** lines and their gateway services. Apparently, their own service is worth over **$4000** to sign up? It would appear that the local RBOC after divestiture have reached the point of being functionally incapable of operating a business not protected by monopoly.

AT&T and the Public Broadcasting Service (the people that bring you animal sex and violence on the Sarengheti plane), are planning direct broadcast television satellites as early as 1993. The FCC is currently considering an application for modification of AT&T Satellite Services Telstar model 401, 402, and 403 satellites. The birds will eventually transmit 12 ku-band TV channels at 120 watts. This is considered very high power by satellite standards and would enable TV reception using very small dishes less than a foot in diameter - perhaps even internal antennas.

WINDOWS 3.0 - OPENING THE CURTAIN

OK, we're just not "graphical" people. But that's NOT why we've avoided Microsoft's Windows in the past. The program promised to let us run multiple DOS applications simultaneously - but the 8088 and 80286 versions didn't actually allow us to run any at all. To run a DOS application, you wound up needing enough DOS memory to run your application AND windows. Unless you did use applications (generally also poor) designed specifically for Windows, the product was for the most part a closed door. The machine was slower, smaller, and more gooey than GUI under earlier incarnations.

The basic premise of multitasking for most things is itself flawed. The standard example is a Lotus 1-2-3 recalculation that takes an hour to run while you happily use the machine for other work. We occasionally do use a spreadsheet - but realistically, not much of one. Our recalculations typically require about 20 milliseconds to run. Most individuals use spreadsheets notably smaller than the example indicates. Assuming you don't plan on using Windows as a multiline BBS, there are only two multi-tasking applications we can think of - print spooling and downloading files in the background.

Switching is another thing. We would die for a machine that would allow us to switch between R:Base, Ventura Publisher, XyWrite, and Telix at will. None of the "background tasks" have to accomplish anything, just be there when we get back - hopefully just where we left them. No data destruction. No lockups. We've tried shareware programs, Desqview, and Software Carousel all with various degrees of calamity. If the machine locks up, and you must reboot, generally speaking whatever you did in any of the switched tasks is lost. We consider any software that locks up the machine, garbles files on the disk, or causes mayhem in the File Allocation Table on the diskette to be rather poorly behaved. While Windows doesn't fully escape this, it seems offer an improvement.

With some trepidation, we tried Microsoft Windows 3.0 on a 20 MHz 80386 machine with 4 MB of RAM. This machine is basically a box of clone junk parts assembled by a local dealer who would shrivel in horror to see the mess we've made of it with add-on circuit cards - some of which actually share IRQs by having their block jumpers replaced by manual switches. Our **CONFIG.SYS** file looks more like the Constitution of the United States in an African dialect translation. If hardware could cause Windows 3.0 to fail, this one would.

We're pleased, albeit surprised, to report that Windows works quite well, within some acceptable restrictions. Further, we think we could become addicted to this program.

We've noticed a couple of things in the press about Windows we don't quite agree with. First the matter of three modes. Windows ostensibly offers three modes of operation: real, standard, and enhanced. Balderdash. Real mode is the basic 8088 version of Windows that didn't work then and doesn't now. Standard mode is the 80286 Windows that didn't work then and doesn't now. Enhanced mode is Windows 80386. It works - on some machines. We consider it a tactical error on the part of Microsoft to include the other two modes. This program is designed for an 80386 machine and running it on anything shy of that is the same kludge they offered before. It will confuse the issue, the user, and anyone programming for the environment. If you don't have an 80386 machine, don't bother with this program.

Most of the press and certainly Microsoft have focused on Windows applications for Windows 3.0, the various gyrations previous applications have to go through to run under the new version, etc. We do hope Bill Gates makes a fortune from this program and from the many applications such as Word and Excel that Microsoft markets. The paltry $2.8 billion the man is worth now can hardly pay the light bill. But the strength of Windows 3.0 is that it DOES run non-Windows applications - regular DOS software. It runs them quite well, and it can run a number of them simultaneously.

OS/2 has struggled as an operating system. Most pundits put this off on the lack of user sophistication and familiarity. We don't think so. There are **30 million** DOS machines out there, each

with five or six DOS applications and 20 utilities that individuals have reconstructed their professional lives around. ANY operating system that requires those people to toss out those applications, just ain't gonna make the trip without offering something so overwhelming that a significant number of people just HAVE to have it. If it's wholesale change for the sake of change, we're going to Unix on a Steve Jobs NeXT machine.

Windows bridges the gap. We successfully ran, and used on an ongoing basis, XyWrite, R:Base, Telix, Norton Commander, and Ventura Publisher - switching freely between them, shrinking them into little windows and expanding them into big ones. We downloaded files in the background - albeit with some missed blocks and a dramatic slowing of foreground activities. Print spooling works fine. We're happy campers.

The boys at Microsoft are undoubtedly happy campers as well. The new version sold **300,000** copies in the first three weeks after release. The company is adding **72** technical support telephone lines bringing the total to **271** and hiring an additional **60** technical support people with a long range plan to add up to **3000** total employees over the next year. The company currently employs about **5500** people. But the number of calls per new sale is actually below that experienced with other software releases. Microsoft has set up two new numbers just for Windows support. If you have questions about Windows, dial **(206)637-7098**. Questions pertaining to Windows applications should be directed to **(206)637-7099**. A new automated voice BBS operates 24 hours to answer most of the common questions and will route you to a support rep between 5:00 AM and 7:00 PM Pacific time.

The strength of Windows 3.0 enhanced mode is that it sets up a virtual machine consisting of DOS RAM, extended memory, and hard drive space. This concept was the basis for most IBM mainframe operation for the past 15 years. Programs are swapped in and out of available memory to disk as needed. You can run multiple programs. When you have more programs than memory, some are swapped to hard disk - treated as a type of slow RAM if you will.

Using program manager, we were startled to learn we had about 8 MB of memory on our 4 MB machine. The difference was that Windows counts the hard disk space as usable memory.

We were somewhat reluctant to switch from Norton Commander to Windows. Surprisingly, we didn't have to. The Windows file manager is slow and uninformative. But it was very easy to create a Norton Commander icon. We can easily drop from Windows into Norton Commander, manipulate files at will, and pop back up into Windows.

In fact mentally, our view of Windows is a bit upside down. Picture three layers of software. At the bottom, you have DOS. Riding atop that, your applications. Windows lays over the top of the applications acting in effect as the "ceiling". By clicking on an icon you can "drop" down to an application or even "down" to DOS. Many applications let you drop "down" to DOS themselves and then exit back "up" to the application. In effect, you still have full access to DOS and your applications, but you may find yourself increasingly using the top Windows layer for navigation.

The program uses and addresses extended memory directly rather than using the expanded RAM kludge we've been stuck with lo these many years. It DOES have an expanded memory manager for those software programs that now REQUIRE expanded memory - Ventura Publisher comes to mind. But basically, Windows is a way to put your full 80386 microprocessor to work - with regular DOS applications.

The program includes a solitaire card game you should see. We're not avid gamers. In fact, we've found games to be time alligators with no purpose or end. But this is a beautiful, easy to use, no instructions needed, emulation of an ordinary game of solitaire. And it is a bit captivating.

There is also a Windows application that comes with the package titled DayBook. Appointment calendar, to do list, calendar functions, etc. It's pretty. It's easy to use. Sure, what the world needs is another appointment calendar. But this one is impressive.

On the downside - Windows does NOT work with our **LANtastic** local area network. Debbie Daun of LANtastic insists they ARE compatible with Windows 3.0 but does acknowledge that you can't run Windows in enhanced mode on a machine that is a server on LANtastic. One of the great strengths of LANtastic is that ALL machines on a net can be both a server and a workstation - giving each machine the complete resources of the total network. This peer-to-peer function is enormously attractive - particularly to small businesses who are not inclined to run off a dedicated Novell server. As we stated, Windows real and standard modes are unusable for any useful work anyway. LANtastic is working on the problem.

There are some other problems. Microsoft is downplaying the fact that Windows has a conflict with **DMDRV.BIN**. Actually, **DMDRV.BIN** is used on a large percentage of MS-DOS machines in the universe. It's the device driver for Seagate drives allowing drive sizes larger than 32 MB. It comes with the On Track Computer Systems Disk Manager software used to install most hard drives in clone machines for the past five years. The "potential conflict" involves damage to the File Allocation Table (**FAT**) on the disk. It can also cause the system to lockup. On Track Computer Systems engineers are working with Microsoft and a fix is imminent.

Finally, there are reports of multiline BBS activity under Windows. One of our subscribers reported successfully running four nodes of **PCBoard** under Windows. Another ran multiple copies of the single line version of **TBBS Information Manager** under Windows. While it seems a bit roundabout, we do look for someone to come out with a four line BBS designed to run under Windows.

Windows 3.0 is priced at **$149.95**. However, it is commonly available in Software Etc. stores and mail order houses for about **$100** including shipping. Microsoft, One Microsoft Way, Redmond, WA 98052; **(206)882-8088**. Lee Winsor operates a PCBoard system in New Hartford Connecticut titled **HH-Infonet** offering information and files on both Windows and OS/2 **(203)246-3747**. Likewise, Jim Appleby in Los Angeles operates **The Business BBS** at

(213)477-0408. The main claim to fame of The Business BBS is Microsoft Windows support.

NEW IBM PS/1 HOME COMPUTER INCLUDES MODEM

As expected, IBM did announce a new series of home computers, dubbed the PS/1 series, ranging in price from $999 to $1999. A boon to the online community, the new models include a built-in modem and Microsoft Works, an integrated software package that includes a reasonably facile communications program.

This could be the beginning of a golden age for online services. The biggest barrier to getting online is getting a modem installed and a communications package to work with it, given the incredible complexity of initialization strings and other esoterica novices have to deal with to dial their first number. By including both modem and comm software with every machine in their new line sold, IBM has essentially wiped out that barrier. That is, if they sell any.

IBM claims to be targeting the new series at 20 million American homes it sees as wanting to buy a computer but uncertain as to which one to buy.

We'd like to see both 9600 V.32 modems and Group III fax built into every IBM compatible motherboard manufactured. If IBM's home computers series catches on, and given the history of the PCjr that's a big if, perhaps on board modems will become ordinary.

GLOBAL CELLULAR SATELLITE NETWORK

They probably read our March article on AMSAT, the HAM radio groups low-earth orbit BBS. Motorola is currently planning a global cellular telephone network using satellite communications. The **$2.3 billion** network will consist of **77** small satellites in low earth orbit by **1996** with two test satellites in orbit as early as **1992**. The project is currently titled **IRIDIUM**.

The satellites, weighing **700** pounds each, will orbit the earth at an altitude of **413** nautical miles. Seven different polar orbits will each contain **11** satellites. Each satellite will pass through as many as **37** "cells" each covering a diameter of **360** nautical miles. The satellites will actually hand off your call to the one behind it as it passes overhead. The number and orbit of satellites will ensure a continuous line of sight from any point on the earth's surface and at any altitude up to approximately **100** miles.

The service will not be exactly a giveaway. Digital cellular handsets weighing approximately **25 ounces** and featuring a built-in antenna will go for about **$3500** and transmission rates of as much as **$3** per minute are foreseen. Digital voice at **4800 bps** and data up to **2400 bps** will be supported. The Iridium cellular telephones, transmitting at **1.5** to **1.6 Gigahertz**, will not be compatible with conventional cellular units that transmit in the **800-900 MHz** range of the spectrum. But you will be able to place a call to virtually any telephone network, ship, airplane, or remote site including existing public switched and cellular networks.

The name of the project is itself interesting. A few years ago, a team of archaeologists led by Luis Alvarez noticed a layer of iridium in rock formations formed at roughly the time of the demise of dinosaurs. The iridium layer was found at the same level virtually worldwide. Iridium is not abundant on earth but is common in space. This led to the theory of the cataclysmic end to dinosaurs by a large asteroid or comet striking the earth. I suppose the **77** satellites giving global coverage corresponds to the iridium layer. Existing cellular networks would then be dinosaurs? In any event, the IRIDIUM project would allow you to place a call from any point on the globe to any point on the globe - an attractive vision.

Each of the **77** satellites will be in a low earth orbit - meaning they actually pass overhead rather than hanging geostationary **23,000** miles out. The system will work like cellular telephones only in reverse. Rather than being handed off from one cell to the next as you move through them, you will be handed off from one satellite to the next as THEY move over you.

Satellite telephone has a bit of a tarnished image. Almost all of it comes from the noticeable delay in transmission - over a **1/4** second, experienced during ordinary conversation. It's caused by the propagation delay to and from the satellite. Even at velocities nearing the speed of light, a trip **23,000** miles out and another **23,000** back from a geostationary satellite is noticeable. Low earth orbit is more like **500** miles out and another **500** miles back - essentially inconsequential. This low earth orbit net has the potential for calling anywhere on earth as clearly and usably as calling LD within the US today.

The real import of this announcement is escaping the attention of a lot industry observers. It is a strikingly visionary plan virtually doomed to success from the beginning. Why? All the world over is NOT limited to our own shores. Most of the third world is already heavily investing in any kind of satellite communications that has the remotest chance of success. The need for communications is both desperate and growing and there is simply no way for them to lay and maintain any form of wire system EVER given the expense of covering vast areas of unruly terrain. Even in our own country rural areas are getting the short end of the stick with regards to modem services. As a result, it is quite likely Motorola could put up such a net and capture the communications of the entire undeveloped world successfully whether or not there was a EVER a U.S. subscriber to it. This could serve as the model for a truly global communications network.

And Motorola knows it. Vice Chairman John Mitchell, in introducing Iridium: "I hope you'll remember today as being a milestone in communications. This is the day that real space communications started for the world."

Radio has in general suffered an image problem the past few years. The general consensus has been that the spectrum is too crowded and there is no where to go. Nonsense. The advances in technology in general in the past few years are sufficient that if applied to radio communications, within a few years we'll wonder how we ever squandered so much spectrum with so little information using technologies largely unchanged for 50 years. Cellular telephone has proven to virtually everyone's satisfaction that the economics underlying mobile radio communications are there. We think the race is on and an entire new generation of radio telephone communications is in the dawning days.

In the U.S. House of Representatives, the House Energy committee has approved legislation that would convert **200 MHz** of underutilized government spectrum to private use. The twist is that the bill calls for auctioning of both spectrum use and communications licenses with the proceeds going to the government. If passed, companies desiring to provide new radio services would bid on a portion of the radio spectrum and if awarded, pay for its use.

Motorola, whatever we make think of them as a corporation, has somehow developed an inspired and innovative vision of tomorrow's global network.

DAT AUDIO TAPE PLAYERS ARRIVE

There has been much discussion of Digital Audio Tape (**DAT**) over the past couple of years. It appears they are finally arriving this summer at prices in the **$800** to **$900** range as a minimum and as high as **$2295**.

The DAT tape recorder/player has been awhile in coming. The fidelity of music recorded on DAT is good. So good, in fact, the Recording Industry Association (**RIA**) has been notably successful

Multiuser BBS with dBASE

The Bread Board System *(tbbs)* Information Manager provides high performance multiuser electronic mail, custom databases, and protocol file transfer on a single PC using only DOS. No LAN or multitasker required.

Think of the possibilities—up to 32 users on a single CPU using only DOS and *tbbs*. Speeds up to 19,200bps with no perceptible multiuser interference! Mix local and remote terminals.

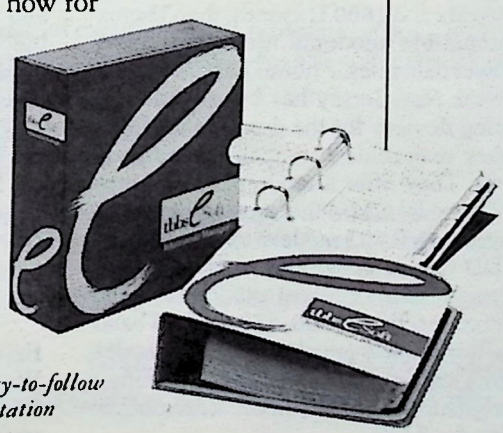
All of the complications of simultaneous multiuser file access are handled for you transparently by *tbbs*. You design and build your specific application with menu templates as though you were in a single user environment. *tbbs* does the rest.

Building custom multiuser information systems has never been easier. You get the system you want, in the shortest possible time. And once your system is built, it is extremely reliable. Because there are no tricky multiuser operating systems or LAN hardware to tame, your system will be stable immediately. Adding users does not affect any programming in the system itself, and thus can be done quickly and will work immediately.

Move beyond multiuser bulletin boards by adding The Data Base System *(tdbs)* dBASE language compiler and expansion module to allow custom multiuser dBASE programs. With *tdbs* you get the easiest multiuser dBASE capability available anywhere. Transparent file sharing, shared screen updates, and remote or local access with no extra programming effort.

16 user *tbbs* $895, 16 user *tdbs* (dBASE compiler and expansion module) $995. Also available in single and 32 user versions. Available now for immediate delivery.

Call for more information and access to a demonstration system (303) 699-6565.



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in holding DAT off of American shores for a couple of years. The RIA feared that once DAT recorders were available, piracy of optical Compact Disc music would run rampant since it would be easy to tape a CD at virtually full fidelity.

More recently, the RIA and DAT manufacturers reached a compromise. The DAT manufacturers would voluntarily include a chip in the equipment to prevent piracy. You will still be able to record CDs, but in doing so, the chip adds an inaudible signal that prevents you from making copies of the DAT tape. Piracy is essentially limited to a single generation.

Aside from higher fidelity, the DAT cartridge is less than 3/5 the size of a standard audio tape cassette and more durably constructed. They also cost a bit more at prices up to **$18** for **120** minute versions. Maxell stocks a **46**-minute blank for **$8.99**.

Four Japanese manufacturers will introduce models in the U.S. this summer including Sony, Denon, Matsushita (Technics), and Japanese Victor Company (JVC). Sony's model **DTC-700** will list for **$900** and the company has a DAT hotline setup at **(201)766-9328** you can use to locate the nearest dealer.

DATs should prove to be a natural tape backup device. Already several manufacturers are offering computer backup hardware in **1 Gigabyte** plus capacities using 4 millimeter DAT tape cartridges. Mountain Computer Inc. **(800)458-0300** has a device titled the **FileSafe 1200** that will store **1.3 GB** on a single tape with a transfer rate of **10 MB** per minute. A full tape would take over 2 hours to backup. The unit is pricey at **$5995**. Maynard Electronics also offers a **1.3 GB** DAT backup device with an **11 MB** per minute backup rate. Maynard Electronics, 460 E. Semoran Blvd. Casselberry, FL 32707; **(800)227-6296**. Finally, GigaTrend offers a 1 GB DAT unit. GigaTrend, Inc., 2234 Rutherford Rd. Carlsbad, CA 92008; **(619)931-9122**. These units are typically priced in the **$4000-$7000** range. Hopefully, the economies of scale will bring down the price of audio DAT, and thereby the computer backup tape units as well to under **$300** within two years.

MODEMS FOR THE DEAF

BBS operators sometimes think the modem was invented for their benefit. Actually, the deaf have used them for years in slightly modified form to communicate by telephone. The devices are termed Telecommunications Device for the Deaf (**TDD**) and many government offices and service industries offer TDD connect lines for deaf customers.

The devices originally used the Baudot code at blazing speeds of **45.5** or **50** baud to convey alphanumeric messages. Today, most **TDD** also offer ASCII text at speeds of **110** and **300** baud as well as the original Baudot code.

American Telephone and Telegraph offers **TDD** operator services at **(800)855-1155** where deaf callers can call with a **TDD** device and receive assistance or information about dialing calls. They also market a **Model 1310 TDD** device for **$429.95** featuring a **24** line by **40** character display and keyboard that can connect at either ASCII or Baudot modes. The device also serves as an answering machine for incoming TDD messages. AT&T, 650 Liberty Ave., Union, NJ 07083; **(800)327-7440** voice or **(201)851-3119** (TDD).

Other companies as well offer essentially bulletin board systems for the blind, including **Merrill Lynch (800)765-4833**, and the **Telecommunications Exchange for the Deaf (301)251-1990**.

Bulletin board operators may want to offer services to deaf callers who use TDD devices. True TDD devices use a slightly different modulation, using **1400 Hz** and **1800 Hz** tones, than Hayes compatible modems along with the slower data rates. **Phone-TTY** of Hackensack New Jersey has been manufacturing devices for the deaf for **21** years - they're the oldest company in the business. They offer a modem, the Phone-TTY model **CM-4** that answers both the normal **Bell 103** modem calls AND the TDD device calls. The modem cycles through nine different modes to make the connection at **300, 110,** and **45** baud in full duplex and half duplex modes from callers who are calling in either originate or answer mode. The modem lists for **$349**.

The company also markets a multiline BBS software program titled **TDDM** (Telecommunications Device for the Deaf Multi-line) that supports up to eight telephone lines. **TDDM** is priced at **$750**. Phone-TTY operates a demonstration system at **(201)489-3323** where you can obtain full information on their product line, including several hardware devices and a dozen software products. Phone-TTY, 202 Lexington Ave., Hackensack, NJ 07601; **(201)489-7889** voice.

In Denver, a local bulletin board has been in operation for years serving the deaf community. David Sheneman's **Denver Deaf-Net** at **(303)989-9245** was listed in our very first issue (March 1987) and continues in operation today.

For more information on TDD devices in general, contact Alfred Sonnerstrahl, director, Telecommunications for the Deaf at **(301)589-3786** voice or **(301)589-3006** (TDD).

LONG DISTANCE RATES FALLING AGAIN

The regional Bell operating companies recently submitted rates for long distance access featuring a cut of approximately **$400 million**. These are the rates long distance carriers such as ATT, MCI, and Sprint pay local telephone companies for access to your telephone. But the FCC had another number in mind. They ordered a **$1.1 billion** decrease instead sending a shockwave through the telecommunications community.

In doing so, the FCC noted that the Bells underestimated demand in switched access service by over **7 billion** minutes and that the local telcos used improbable assumptions and predictions and committed other accounting errors in calculating their rates. Most notably, the FCC threw out all expenses relating to the Bells lobbying efforts. According to the FCC, although the BOC are entitled to engage in lobbying, the commissions rules make clear that associated expenses must be excluded from ratemaking.

Essentially, the local Bells were in Washington spending money like drunken sailors trying to get Congress to free them from restrictions levied by

ONLINE PERIODICALS

You operate the very best electronic bulletin board system you possibly can. And you try to provide your callers with the best entertainment, news, software, and technical information you can find. We're here to help with online information products you can use to your callers benefit. And that means increased paid subscriptions to your system.

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Published by Gannett New Media each business day, USA Today Decisionline provides a remarkably concise, readable, online morning summary of the events of the day for your callers. Averaging 65 KB each morning in archived format, USA Today Decisionlines provides news on eighteen topical categories including:

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BOARDWATCH Online Edition

While the online information services industry is broadening daily, the number one topic of interest to most callers is still how to put their modem into play for maximum benefit. And since March 1987, Boardwatch Magazine has been the best way to do it. Now, we've introduced an Online Edition specifically for display on your information service. Boardwatch contains the full text of our printed magazine, along with our National List of Information Services containing over 150 product support systems, free government database services, and selected bulletin boards of note from all over the U.S and Canada. Boardwatch places the same information you now hold in your hands - the best information the online world has to offer each month - up on your callers screen. Get the definitive publication for the online world for your system. Boardwatch is available at a quarterly rate of $75 or an annual rate of $250.

ONLINE SPORTS STATISTICS

Terry McCraith's puts twelve years of experience as a professional book maker to work for your BBS system with Online Sparts Statistics. Incredibly detailed stats on professional and collegiate sporting events your callers can use to "beat the game". Updated weekly at $75 per quarter.

BBS CALLERS DIGEST

Richard Paquette's monthly collection of interviews with shareware authors, BBS system operators, and callers provides online industry insight and tips for those new to the online field. $80 per year.

To see these products in action, call our Boardwatch Online Information Service at:

(303)973-4222 (2400 bps)
(303)933-2286 (14.4kbps HST/9600 bpsV.32).

the Modified Final Judgment reached during divestiture in 1984. Since local PUCs are not likely to allow that in their local rate calculations, they put them into the calculations for long distance carrier access. This would then be part of the cost of long distance calls and since those costs are dropping anyway, you would be none the wiser. Elegant in its own twisted way. Several alert consumer groups, including the International Communications Association, called the FCC's attention to the matter.

The FCC action has resulted in an immediate benefit to callers. AT&T, who had already filed for a **$160 million** rate cut, has upped the discount to **$300 million**. Spokesmen for MCI Communications have said they will review their competitive rate position.

Long distance rates, since competition was established at divestiture in 1984, have fallen a total of **43%**.

AT&T PURCHASES WESTERN UNION E-MAIL

AT&T has agreed to buy the e-mail business of Western Union. Western Union, reeling from the virtual demise of it's Telex business faces Chapter 11 bankruptcy. But their **EasyLink** electronic mail business is thriving with some **210,000** subscribers and they've been very aggressively pursuing link ups with other e-mail services. Western Union was at the forefront in organizing a consortium of e-mail vendors to implement the **CCITT X.500** e-mail address directory. The sale is surprising in that e-mail and telex still comprise **40%** of Western Unions **$628.7 million** in revenues.

AT&T also provided e-mail services but to a much smaller group of subscribers - perhaps **80,000**. By purchasing Western Union's e-mail business for **$180 million**, AT&T immediately leaps into a position as probably the largest e-mail system focused on business use in the nation with **290,000** users. **SprintMail**, by contrast, has **180,000** subscribers and **MCI Mail** sports **110,000**.

AT&T gets **1160** Western Union employees as part of the deal. That group earned **$72 million** on **$303 million** revenues last year. The sale should be completed by September.

SEAGATE INTROS NEW DRIVES

Seagate Technologies is currently sampling two large capacity, fast hard disk drive units. The **ST1480N** and **ST1400N** feature the **SCSI-2** interface. This is a higher performance version of the now familiar Small Computer Systems Interface (**SCSI** - pronounced "scuzzy"). The drives rotate at **4400 rpm**, somewhat higher than the more conventional **3600 rpm** and feature an average access time of **14 milliseconds** with data transfer rates of **5 Mbps**. The **ST1480N** is a **426 MB** drive unit while the **ST1400N** stores **331 MB** formatted. Pricing has not been determined. Seagate Technology, 920 Disc Drive, Scotts Valley, CA 95066; **(408)438-6550**.

AMERITECH INSTALLS INDIVIDUAL ISDN LINES

Illinois Bell has filed a tariff with the Illinois Commerce Commission to offer individual Integrated Services Digital Network (ISDN) Basic Rate Interface telephone service to residences and small business customers. This is the first offering in the nation of individual line **ISDN** and marks the beginning of the nations shift to **ISDN** service.

ISDN Basic Rate Service provides two **64 kbps** digital bearer channels and one **16 kbps** supervisor, or data, channel. Often referred to as **2B+D**, the most immediately attractive feature of this type of service is the ability to make two simultaneous calls from different extensions using the same telephone line. Also integral to **ISDN** is the calling party identification feature notifying the subscriber of the telephone number of any incoming calls.

The Illinois Bell offering is notable in that it is the first filing that actually establishes what **ISDN** will cost the individual subscriber. The Illinois tariff specifies a monthly service rate of **$22.66** and an installation cost of **$94.50**. By contrast, two regular business lines cost **$18.78** monthly each plus installation charges totalling **$148.50**. As such, **ISDN** is actually cheaper for businesses requiring at least two lines and only slightly more than a single line installation. It also allows large companies it "experiment" with

GW Associates

Communications and Messaging Systems Specialists

PRESENTS

The all new **Message Manager** for TBBS/TDBS systems. This program is the creation of Ben Cunningham, one of the pioneers in writing programs for The Data Base System (TDBS). Some of the highlights of this package are: Support for up to 10,000 message areas; SysOp configurable full screen editor; SysOp configurable reply quoting; the capability of editing messages after they are saved; the ability to perform **any** kind of maintenance while the BBS is on-line; the ability to import and export text while the BBS is on-line; users can change several message reading options at any time and save them to disk to make the changes permanent; users can subscribe to up to 60 message areas and see all the new messages in each area when they enter the message menu; message areas can be made to be anonymous (user name not in message headers); message areas can be configured to be auto-addressing (i.e. all original messages are sent to a specified name); complex and/or search capability on any combination of FROM, TO or SUBJECT fields; message text can be searched for strings; users are automatically notified of messages waiting at log-on or upon entry to a message area; carbon copies are supported; software uses unique transparent message threading; FidoNet format message import and export utilities are now being developed, etc. This program will be priced starting at $179.00.

The extremely popular game of **StarQuest.** This is the first multi-player, multi-user space game to run under TBBS/TDBS. You can create a universe of a size that is best for your system and its users and your users create and capture settlements and become active wheeler/dealers across your universe. Their settlements can be attacked and captured whether the user being attacked is on-line or off, and as the users gain in strength and worth the computer controlled pirates and the tax assessor will be there to lend a helping hand. This on-line multi user game has already proven itself to be popular with the users and it's not only a lot of enjoyment for them but it can quickly pay for itself on systems charging for access. This program is priced at $149.95.

The powerful and productive **On-Line Sales Manager.** This on-line catalog sales program is written by Jeff Johnson, another pioneer in TDBS software, and it easily shows the power and capabilities of TBBS and TDBS. The Sales Manager will display a catalog of items for sale under categories you specify, each item can have a full descriptive text file attached to it and the user can place an order at any time and continue to browse through the catalog. When done the user selects to order and is presented with each item and given the opportunity to indicate how many are to be shipped. Once all items are ordered the software will check to see if the customer has an account, if not it will prompt for all necessary order information. Developed as a modular package this software will handle everything from a low level order entry system to a fully featured point-of-sale package that will print invoices, track inventory, track billing and do all the things you would expect of a full sales package. It really must be seen to be appreciated. This package starts at $395.00.

There's a lot more available for the TBBS/TDBS SysOp, as well as for anyone interested in an Information System (BBS), all you need to do is call our system and browse through Our Demonstration and Sales Area and take the time to register as **a** customer. GW Associates offers full support to all SysOps and we have several excellent programmers available to help with your applications and customization. Please call our system at (508) 429-1784 (N,8,1) and keep up with our new releases or call us on our voice line at (508) 429-6227 if we can help you in any way. Installing commercial systems is our **ONLY** business, and we're good at it!

TBBS/TDBS/TIMS SUPPORT * TBBS/TDBS/TIMS SUPPORT * TBBS/TDBS/TIMS SUPPORT * TBBS/TDBS/TIMS SUPPORT * TBBS/TDBS/TIMS SUPPORT

just a few ISDN lines without committing to a complete change of telephone system. This should provide a big push toward ISDN installation.

WILDCAT BBS SOFTWARE AVAILABLE IN RETAIL STORES

The BBS software industry continues to mature. Mustang Software has announced availability of the single line version of their popular **Wildcat BBS** in **230 Software Etc.** stores nationwide. This makes Wildcat the first commercial BBS software package available "off the shelf" so to speak in retail stores.

Wildcat version **2.15** will be available with full documentation and attractive packaging at a **$129.00** list price. If Software Etc. follows their usual practice, the actual price should be at some significant discount from list.

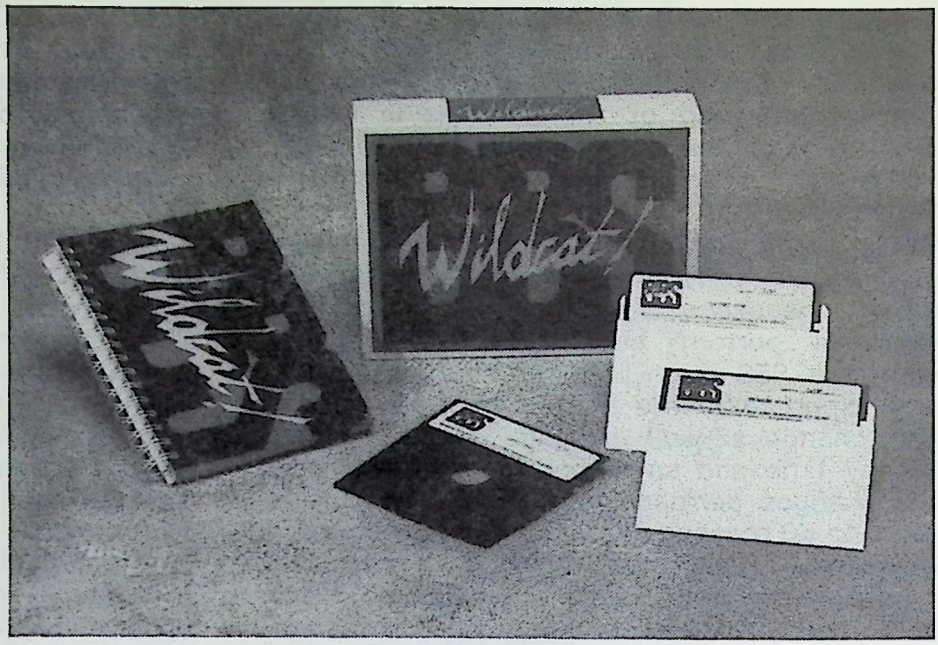
The BBS software package has developed a particular following among companies wishing to add an attractive dial up front end to existing Local Area Networks (LAN).

Computer Stores who would like to carry Wildcat Version 2.15 at retail may request the product through the distributor - Software Resource, 8 Digital Drive, Suite 100, Novato, CA 94949; **(800)851-9009.**

NATIONAL SUPER NETWORK CLOSER TO REALITY

Senator Albert Gore's proposed National Research and Education Network data superhighway took a step toward reality this past month. The Senate Energy committee approved a bill allocating **$675 million** for the Department of Energy to construct the network and form both a research and development consortium and a super computer task force.

Gore's bill calls for a very high speed data network to link universities and research labs in the spirit of the Eisenhower Administrations interstate highway system.



LOTUS GOES INTO LAWSUIT FRENZY

Lotus Development won a clear cut victory in a three-year old suit against Paperback Software claiming that the VP Planner spreadsheet program infringed on the copyright of their popular Lotus 1-2-3 spreadsheet by copying the "look and feel" of the program.

In a June 28 decision, U.S. District Judge Robert Keeton ruled that the menu structure of 1-2-3 program is an original and non-obvious way of expressing a command structure. Taken as a whole, including the choice of command terms, structure and order of those terms, their presentation on the screen, and the long prompts, is an aspect of 1-2-3 that is not present in every expression of an electronic spreadsheet.

While VP Planner is not a particularly strong competitor of Lotus, Borland's Quattro Pro is. Recently, Borland began a massive direct mail campaign offering their spreadsheet at **$99.95** with very comparable features to current Lotus users. Borland claims to have sold over **300,000** copies of the program - priced at roughly a third of Lotus 1-2-3.

Scarcely was the ink dry on the Paperback Software decision than Lotus filed suit in Boston against both Borland and The Santa Cruz Operation (SCO). Borland markets a spreadsheet titled Quattro Pro while SCO provides a spreadsheet product for Unix systems. While Borland's Quattro Pro is not nearly as much of a clone of 1-2-3 as VP Planner, it does have its own menus and command structure, and it's certainly more of a threat in the spreadsheet market.

Borland barely beat Lotus to the punch by filing for declaratory relief in San Jose California just prior to Lotus filing in Boston. This may force the legal battle into a local venue for Borland.

UPGRADE 80386 to 80486 WITH MODULE

Transcomputer Inc. has introduced a **$486** plug in module to upgrade **80386** microprocessor computers to **80486** capabilities. The module plugs into the

microprocessor socket on the existing motherboard. Termed the **Trans 486PX CPU Translator Module**, the unit consists of an **Intel 80486** microprocessor and some control circuitry. The **80486** chip features an internal math coprocessor and RAM cache. Additionally, the module can take advantage of any cache-RAM capabilities already on the **80386** motherboard. Additionally, the clock speed may be a bit higher. A **16 MHz 80386** machine can be clocked up to **33 MHz** using the module. Transcomputer Inc., 1257 Tasman Drive, Sunnyvale, CA 94089; **(408)747-1355.**

LAPTOP FEVER

ZEOS ANNOUNCES 386SX LAPTOP FOR $2195

"This is the one you've been waiting for. The ZEOS 386SX Portable. It's a complete high performance 386 system loaded with features. And the price is incredible. Wait no longer!"

That's the lead-in for ZEOS's new portable computer advertisement appearing in several industry magazines. Unfortunately, you WILL have to wait a bit longer. The machine doesn't ship until October.

Nonetheless, at least in July the new laptop looks attractive at **$2195**. The unit is based on the **80386SX** microprocessor running at **16 MHz**. It features both a **42 MB** Seagate **IDE** hard drive and a **3.5-inch 1.44 MB** floppy. It comes with **1 MB** of **RAM** expandable to **8 MB**. And it features a **640X480 VGA** gas plasma display.

The unit is not a lightweight at **12 pounds** but it may shape up as one of the best connected laptops available. You can connect it to an external **VGA** monitor. It comes with a parallel port and two serial ports. It also has a 5.25-inch external floppy drive port. Best of all, it can hold **two standard 8-bit half-length expansion cards**. The company offers a series of optional cards using this standard bus, including a fax/modem card at **$199**, various LAN networking cards, and an SCSI interface card that allows you to run up to six additional SCSI devices such as large hard disks, tape backup units, optical drives, etc.

The unit measures **13.6 X 15.4 X 3.8** inches - again, not in the briefcase league. But for a full featured 386SX box with a good sized hard drive, this looks good at **$2195**. With the half-card slots and existing ports, this looks like virtually a portable BBS. That they are actively advertising the unit four months before it will be available is a bit discouraging. ZEOS International, 530 5th Ave NW, St. Paul, MN 55112; **(800)423-5891.**

ZENITH DROPS 2-INCH FLOPPY

Zenith Data Systems for the most part orphaned buyers of its **MinisPort** notebook computer. The company has announced a new version featuring a built-in **20 MB** hard drive and NO on-board floppy at a price of **$2799 - $1000** more than the earlier version with the controversial non-standard **2-inch** floppy. The company admits the **2-inch** drive may be a little ahead of its time. The move essentially leaves those who purchased the earlier model hanging with abandoned experimental drives and no upgrade path. The new **MinisPort HD** weighs six pounds and measures 1.3 inches in thickness. It does include a separate 3.5-inch floppy that can be connected to the unit with a cable. The system features 1 MB of RAM, an 8088 microprocessor and MS-DOS 3.3. An optional 2400 bps modem is available for **$399**. So for about **$3100** you can have an 8088 machine in miniature. Such a deal. Zenith Data Systems Corp., 1501 Feehanville Dr., Mount Prospect, IL 60056; **(800)553-0331.**

AIRIS INTROS VH-286 NOTEBOOK

Airis Computer Corp. plans to ship their first notebook computer beginning in September. The unit offers several unique features including the ability to run off **10** standard C-cell batteries in either alkaline or nickel-cadmium. Alkaline batteries offer an impressive **12** hours operation while an optional Nicad package provides six to eight hours operation.

The system weighs a very light **6.5** pounds and features **640X480 VGA** resolution in **16** gray shades on an **11**-inch backlit **LCD** screen, **2 MB** of **RAM**, a **12 MHz 80286** microprocessor, and **20 MB** hard disk. It also includes a **2400 bps** internal modem, a **256K** hardware disk cache, and the system **ROM BIOS** is actually stored in a flash **EPROM** that can be updated by calling a support BBS by modem. An optional **3.5**-inch external floppy is available. The new notebook computer will be sold directly to consumers by mail order at a fairly attractive price of **$1899** considering the features. Airis Computer Corp., 1824 N. Besly Court, Chicago, IL 60622; **(312)384-5608.**

OPERATION SUN DEVIL - MORE HERE THAN MEETS THE EYE

By now, you've no doubt read numerous articles on **Operation Sun Devil** - the two-year Secret Service sting operation ostensibly aimed at a nationwide network of online criminals. The investigation culminated in a **May 8** sweep involving **150** federal agents who served **27** warrants in **14** cities and confiscated **40** computers along with **23,000** computer diskettes. You may have wondered why stories have been appearing in numerous general press publications while we've remained largely mute on it.

You'll read many articles in Boardwatch regarding online affairs months before they surface in other publications. But on the other hand, some are going to seem to run a little late while we track down what's really going on. We're just stunned that the *New York Times, USA Today, Newsweek*, and most of the free industry tabloid press has become so knowledgeable on this subject so quickly. They must be a lot smarter and tremendously better connected to the online world than we are to write so knowledgeably on such a com2plex, and as it turns out sinister issue. On the other hand, we would like to have seen ONE of them to strike at least PART of the story a glancing blow toward reality.

And frankly, we've not yet got full information on this one. But a story is emerging that should be told and we do know enough at this point to publicly come out with a position that almost everything you've read to this point is pure D-grade bullshit issuing almost solely from Secret Service press releases.

The industry tabloid press seems to have a fascination with a mythical, all powerful "hacker" that strikes fear in the heart of the MIS director target audience they all seem to hold so dear. This is complicated by the fact that the purported "hackers" themselves tend to play up to this in a bit of a hammish way - Andy Worhol's fifteen minutes of fame so to speak. The stories we've seen thus far have been so one sided, that we had to look a little further. What we've found so far has been startling in its variance from published reports.

There does appear to be an element of crime involved - though not nearly to the degree portrayed. And the number of innocents bludgeoned by the stunning dearth of knowledge on the part of the Secret Service in the process is awe inspiring. There is almost no attempt to convict anyone of any crimes. In fact, there have to this point been no charges filed relating directly to the May 8 sweep and a scant handful from a related theft of a telephone company document. Operation Sun Devil appears to be a preemptive strike by the Secret Service to cast fear into the hearts of online aficionados before the problem of online crime gets "out of hand". That most of the Constitution of the United States got stomped into the asphalt in the process is virtually mute. The strategy appears to be somewhat effective.

The controversy revolves around a group of online ne'er do wells that call themselves "The Legion of Doom". By all accounts, this is a rather loose but secretive "organization" of certainly less than twenty individuals in the throes of puberty that go by "handles" such as Scorpion, Acid Phreak, Phiber Optik, and Terminus. They are undoubtedly up to no good. The extent of their actual crimes is a little hazy however. This is complicated by the fact that they don't mind at all being portrayed as invincible computer experts and they do love publicity to the point of playing their role as online mystics and masterminds to the hilt.

Both Acid Phreak and Phiber Optik have been on the Whole Earth Lectronic Link (**WELL - 415-332-7190**) a number of times. John Perry Barlow, a Grateful Dead lyricist from Pinedale Wyoming who frequents the service asked Acid Phreak why the group referred to themselves as The Legion of Doom. The response indicated that image is all. "***You wouldn't want a fairy kind of thing like Legion of Flower Pickers or something.***"

The reports of break-ins to **911** emergency services appear to be wholly without merit. We cannot find any evidence that such has occurred and certainly none of the life-threatening vandalism alluded to in the popular press. As far as we can determine, it never happened.

What we have learned is that in December of 1988, a 20 year old Atlanta resident named Robert Riggs who refers to himself as "The Prophet" did gain unauthorized entry into a Bell South computer and downloaded a three page text file titled **Bell South Standard Practice 660-225-104SV, Control Office Administration of Enhanced 911 Services for Special Services and Major Account Centers** dated March 1988. The Prophet does claim to be a member of The Legion of Doom.

The Prophet apparently uploaded the file to numerous bulletin board systems. The document not only does NOT contain any access codes or procedures that could be used to break into a **911** service, but was remarkable only in it's turgid, opaque, bureaucratic prose that ostensibly described administrative procedures and responsibilities for marketing, servicing, upgrading, customer training, and billing for Bell South's **911** system. According to Barlow, "It is, quite simply, the worst writing I have ever tried to read."

Apart from its alarming lack of literary merit, Bell South valued the document at precisely **$79,449**. This placed the value in excess of the **$5000** required for the Secret Service to be empowered to act. While some may look askance at the figure, our own experience in large corporations would indicate that Bell South probably did invest at least that amount in writing a three page document. That doesn't mean it's worth that amount, and in this particular case it is clearly worthless to anyone, undoubtedly even to Bell South. But it no doubt did cost them that amount to produce it. If you wonder why your local telephone bill is ever rising, look no further than this paragraph. Bell South by their own calculation spent **$79,449** to produce three pages describing who in their organization was responsible for customer training in the operation of a service that puts the name and address of the caller on a display screen. The document contains nothing to indicate it is classified or even proprietary. Pure bureaucro-drivel.

But it did serve as a sort of "trophy" of the break in to the Bell South computer system. The document was uploaded to a BBS in Lockport Illinois titled Jolnet run by Rich Andrews. Mr. Andrews, also unable to make heads or tails of the document, did think it suspicious and he forwarded copies of it to the telephone company. In due turn, he was contacted by authorities and promised to cooperate with them fully. His reward? The Secret Service came to his house and confiscated the computer and all data related to it - taking Jolnet off line since. Andrews was of course not charged with anything, but all of his equipment and software were nonetheless seized. Refer to our June editorial.

One of those downloading the document from Jolnet was a twenty year old hacker who referred to himself as Knight Lightning. Knight Lightning publishes an electronic only publication titled PHRACK out of St. Louis Missouri. The title derives from the words Phreak and Hacker. Phreaking is a term referring to unauthorized use of the telephone system for long distance calls without paying for them. The original term hacker has nothing to do with online crime at all. Unfortunately, some of the online vandals have adopted it as well, confusing the issue terribly.

Knight Lightning published the document in its entirety in an issue of PHRACK. As a result, Frank Darden, AKA The Prophet, who had originally broken into the telephone company computer, was arrested on February 7, along with White Lightning, Frank "The Leftist" Darden, and Adam "Ur-

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"Exec-PC, the bulletin board answer to SuperStation WTBS, connects PC users continents apart." PC World

"One of the best is Bob Mahoney's Exec-PC out of Shorewood, Wisconsin..." PC Magazine

"They provide one of the largest, most extensive libraries of public domain software in the world." Denver PC Boardwatch

"Exec-PC Network is by far the largest BBS we've ever seen. You say you want files? This board has them—whatever kind you want... In addition to having one of the largest selections of public domain software, this BBS is a good source for technical information and help." PC Resource Magazine

WHAT YOU COULD HAVE

Would you like public domain and shareware word processor programs, communications programs, or excellent database management systems? How about personal money managers, or General Ledger programs? If that is not enough, look at the 3000 games and 15,000 free business oriented programs, utilities, tutorials, and reviews. This gives you everything from hard disk reorganization and backup to stock market management systems. We also maintain the *entire PC-SIG collection* online, the 1400+ diskette collection of public domain software from California.

WHO HAS IT?

Exec-PC owns and operates the nation's largest electronic Bulletin Board System. Through our BBS, our huge software collection is available to anyone who has access to a modem and a telephone line. We have more than 90,000 individual files available for immediate download to your computer, 24 hours a day, every day.

WHAT IT IS

The BBS consists of a large computer with BIG disk drives (more than 6 gigabytes!) and many phone lines connected to it. The computer currently has 100+ phone lines, allowing it to talk to 100+ callers at once; it receives about 3000 calls per day. Using the BBS is easy, since it is menu driven and you simply choose what you want to do.

WE SURE HAVE FILES

A typical user will call the BBS, ask the BBS to show what files are new since his or her last call, find files of interest, then transmit those files across the phone line. After hanging up, the caller can examine and use the new software.

WE SURE DO TALK

Our BBS also has an active conference system where thousands of people share ideas and solutions. Some conferences include: PC General Topics, Communications, For Sale, Programming, Desktop Publishing, LAN, Graphics, Hardware Speedup, CAD/CAM, Private e-mail, etc. Why pay expensive consultants when there are hundreds of experts available in our forums and conferences?

HOW TO CALL THE EXEC-PC BBS

1. Set your modem for 8 data bits, No Parity, 1 stop bit.
2. Dial 414-789-4210.
3. The BBS will ask for your name, then you will be guided into the menus.

IT IS FREE, BUT

You can call the BBS at any time without registering. You can tour the system, read messages, and download some of our files. For greater access privileges you may register at the following rates: $20 for 3 months or $60 for one year. There are no hourly or hidden fees! You may subscribe online with VISA or MC, or by credit card, check or money order with the form below.

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☐ Check Enclosed ☐ Visa ☐ MasterCard

Credit Card Account # _____

Signature _____ Expires ___/___

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Name _____ Date _____

Address _____

City _____ State _____ Zip _____

Telephone (___) _____

Company (optional) _____

Name you will use for Logon to BBS (required)

First _____ Last _____

Password _____

ville" Grant. Most of the charges revolved around interstate transport of stolen material worth more than $5000, fraud, and conspiracy. All equipment was of course seized. Ostensibly, the charges carried 40 years in jail and a $2 million fine. On July 9, they pleaded guilty in exchange for suspended sentences. They've agreed to help Bell South fortify its system security.

On March 1, the Secret Service visited Steve Jackson Games of Austin Texas. They turned the place upside down, destroying office furniture, cutting locks, and carried out three computers, a laser printer, various piece parts, and all the paper and diskettes they could find. Their warrant was not signed by any judge and was obtained under seal. It stated only that they were looking for evidence related to data piracy.

Steve Jackson Games publishes games oddly enough. Dungeons and Dragons is perhaps the most widely known of a genre of fantasy games termed Role Playing Games, or RPG. Steve Jackson Games is a rather successful publisher of role playing games. The games do not even run on computers. They tend to be rather complicated books of rules that are played almost entirely on pencil and paper with the aid of dice. These RPG do seem to attract people who become obsessed with them. But that is not the reason for the Hunnish intrusion by the Secret Service.

The managing editor at Steve Jackson Games was a gentleman named Loyd Blankenship. The game of interest to the Secret Service is titled ***GURPS, Cyberpunk***. GURPS stands for Generic Universal Role Playing System. The game is ABOUT breaking into mythical computers. There are no tips or tricks contained therein for doing so. In fact, whether a player "cracks" a computer in the game or not is strictly a function of a role of the dice. The Cyberpunk game revolves around a dystopian science fiction future evoking a picture of George Orwell in frightful collaboration with Ray Bradbury. The game is almost prophetic in that the future implied pretty much visited Steve Jackson Games this past March 1. According to Steve Jackson, "You couldn't break into a computer using this book to save your life. You can learn more about unauthorized entry into a computer from Clifford Stoll's book ***Cuckoo's Egg***, than you possibly could from GURPS CyberPunk. This is a role-playing game based on dice."

So why the intrusion? There are a couple of theories. Loyd Blankenship did strive to impart the flavor of the hackers world in the game and did in fact assume an online handle of "The Mentor". He attempted to contact members of the Legion of Doom to do some background research on the subject of hacking in general to make the game somewhat realistic.

There are also persistent rumors that the Secret Service is running a program to download massive amounts of data and message traffic from computer bulletin board systems. They then search for keywords pertaining to hacking, phreaking, and online crime. According to Jackson, they would have hit the jackpot there on his BBS, **Illuminita (512)447-4449**. They had some early drafts of GURPS Cyberpunk online. Lots of keywords. No real tips on hacking.

But one of the terribly technically competent Secret Service agents did mention during the search that they considered Cyberpunk to be a "handbook for computer crime." They also alluded to the fact that they had to take the laser printer to examine the "ribbon".

On June 21st, all the equipment and most of the data was returned to Steve Jackson Games. According to Jackson several pieces were somewhat badly damaged. He doesn't think it was necessary malicious. It appeared to be just gross mishandling. The escapade delayed the introduction of GURPS CyberPunk for six weeks. The episode cost Jackson about $125,000 by his figures. No charges were filed. And they still haven't determined what led to the search warrant. They were simply told it was filed under seal.

In all, 27 warrants were served in 14 cities and 40 such computer systems were confiscated in the May "raid". We haven't yet run across an account of anyone in that particular raid actually committing any crimes and none from the May sweep have been charged. Stories of incredible technical ignorance/ineptitude among the 150 agents involved continue to surface. The story emerging seems to be one of innocent online communicators such as Andrews and Jackson abused by a system gone wild in a frenzy of online witch hunting. We have not yet confirmed reports circulating of households searched while held at gun-point, choke holds on suspects, etc. These stories can perhaps be embellished as they are repeated. We'll try to turn up the facts as we can. Again, even with fairly wide online contacts the going is slow. The real professionals at the larger publications clearly have techniques in the online world we've yet to discover in order to be able to come up with such a quantity of misinformation so quickly.

But there is a counter movement coming to play. It seems that John Barlow had received a visit from an Agent Richard Baxter Jr. of the FBI. Apparently, a group called the **NuPrometheus League**, comprised of ex-Apple computer employees, had access to the source code for the Macintosh operating system. They posted a small section of it pertaining to the Color QuickDraw function on several BBS. This supposedly sent John Sculley into a fit of apoplexy and he called in the FBI to investigate. Agent Baxter, armed with an impressive array of misinformation from Apple, was canvassing attendees of the annual Hacker's Conference. It seems he was told by Apple that the Hacker's Conference was a hotbed of computer crime. Actually, the Hacker's Conference largely uses the term Hacker in the earlier computer hobbyist sense. It originated in 1984 as an annual convention sponsored by the Point Foundation and The Whole Earth Review. The Whole Earth Review is in some sense the parent organization of The Whole Earth Lectronic Link (**THE WELL**) a popular Unix based online service.

Each year, about 100 luminaries from the personal computer world are invited to attend, including the likes of Mitch Kapor, Steve Jobs, Steve Wozniak, Bill Gates, etc. - the people who ushered in the personal computer.

According to Barlow, Baxter didn't know a ROM chip from a vice grip, had no idea what source code was or how it could be distributed online, and thought that from the Color QuickDraw segment, millions of clone Apples were about to spring forth from the earth and put Apple Computer out of business. John Draper was ostensibly the CEO of

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Boardwatch Magazine 12/89

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Autodesk, another heavy in the world of online crime. Autodesk is actually the developer of AutoCAD and John Draper has never been CEO of anything we're aware of. And Baxter was further convinced that the title of the NuPrometheus League was actually the New Prosthesis League.

Back on THE WELL, Barlow engaged in some discussion of this matter with Mitch Kapor, head of Lotus Development. Mr. Kapor actually landed his corporate jet in Pinedale Wyoming to visit Barlow and spent the afternoon listening to such tales of terror. His response was rather swift and convincing. The pair called in the New York law firm of Rabinowitz, Boudin, Standard, Krinsky, and Lieberman. This led to further meetings with some of the victims of the May raid. Out of this, they formed a group titled the **Electronic Frontier Foundation** dedicated to raising and disbursing funds for education, lobbying, and litigation in the area of extending our constitutionally guaranteed freedoms to the online world.

After Kapor's plans for the Electronic Frontier Foundation were announced in the press, **Steve Wozniak**, one of the original inventors of the Apple computer, called to announce he would match Kapor "dollar for dollar" in supporting the group. **John Gilmore**, one of the founders of SUN, likewise joined the group. A number of other luminaries from the origins of personal computers are reportedly jumping into the fray.

Both the general and the trade press have been universally unkind to Mr. Kapor and his stand on this issue. There is little in the way of sympathy for the stereotypical "hacker". One cartoon shows Kapor holding a freedom banner aloft with the aid of a teenage BBS operator. The next panel shows Kapor attacking the kid after he learns that 1-2-3 is available for download on the lad's BBS. We've never seen a copy of 1-2-3 available for download and by and large the BBS community does a pretty good job of policing itself with regards to software piracy. The panel is typical of the type of uninformed drivel we've seen regarding this issue.

It would seem that everyone is for freedom as long as it's for a good cause. The online world is being universally painted with a rather dark brush and freedom is somewhat less important when applied to THOSE people - always more dear when applied to ourselves. The heart of the problem lies in the rampant lack of technical understanding of the online world in our law enforcement bodies, which is somewhat understandable if not acceptable, and the apparent similar lack of knowledge among the trade press, which is NOT understandable and certainly not acceptable. Against such a tidal wave of misinformation and misplaced sentiment, Mr. Kapor's stand would seem enormously disadvantageous to himself and to his company.

Doing "the right thing" as you see it is not so very hard. Doing the right thing when there is little in it for you, and a

great deal of potential harm, is a mark of personal heroism all too rare in our present world. Salute.

Those wishing to join the effort may contact the Electronic Frontier Foundation, 1 Cambridge Center, Suite 300, Cambridge, MA 02142; (617)577-1385 voice; (617)225-2347 fax. Internet address: eff@well.sf.ca.us

INTERNET LINKING UP THE E-MAIL WORLD

For years the chant has been the same. "I would use e-mail, but it seems whoever I would want to send a message to is always on a different e-mail service." It has become a legend of our times that e-mail is inherently made up of islands of service. You can send a message to someone else on the same service instantly. You can't send a message to anyone on another service at all.

Recently, there has been much ado about linking the major e-Mail services using the **CCITT X.400** standard. **X.400** is a curious animal. It was primarily intended as a standardized ADDRESSING method to allow e-mail links between different services. It hasn't worked out that way. Instead, most of the e-mail services have taken the more esoteric technical elements of **X.400** and used them to electronically link their services. Unfortunately, the concept of a universally standard addressing method, or user interface, has been tossed out the window. All services have their own interpretation of what **X.400** means and you will notice few similarities between the services.

But e-mail will never reach its full potential in linking services. It must eventually link desktops. A method of addressing must be devised that is rational as well.

While all the **X.400** brouhaha was going on, it would appear that an organization titled **INTERNET** snuck into the switching room and hooked us all together without telling anybody. This minute, from virtually any Fidonet BBS system in the country, you can easily send an e-mail message to another person, not only within Fidonet, but throughout the Unix world and on most public e-mail services as well, including MCI Mail, CompuServe, AT&T E-mail, and Sprint Mail. Best of all, it is essentially **FREE** and there is currently no effective machinery for charging for it at all.

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A MEMBER OF THE U.S. LINK SYSTEM

The key to all of this is Unix. The Unix world is just a bit bizarre. The operating system was created with communications in mind and it does do a credible, if uninspired job of networking through the Unix-to-Unix Copy Program (UUCP). Over the years, a number of government agencies, universities, and private companies have linked together their relatively expensive Unix minis into a hodgepodge of networks.

USENET is simply an impromptu network of some **20,000** Unix machines in **40** nations with roughly a million users connected using UUCP, or its DEC VMS counterpart, to pass mail. Anyone with a Unix machine in their business, and even some individuals who run small Unix BBS systems can be connected to Usenet simply by finding an existing Usenet system willing to allow the connection. USENET News Groups are shared topical message areas similar to Fidonet echomail conferences. There are probably **600** Usenet News Groups covering everything from happenings in China to Rock N' Roll with a few covering neural nets and child care.

In the past, you could conceivably send a message from any Unix machine to any Unix machine on any of the networks. The problem was that you had to know the PATH. Path addressing was the paragon of obtuse, indecipherable messaging. In the address itself, you had to provide a complete routing instruction specifying every machine in the link from the sending system to the receiver. Individual stops were separated by an exclamation point, usually termed a bang. The entire scheme was called bang-path addressing and very few could actually master it. Once two individuals "found" each other, they conventionally saved the bang path in a macro file or other hideaway to whip out if the need arose.

In recent years, this has improved dramatically using name domain addressing. Essentially, the address consists of the user name, the @ symbol, and the

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domain address of the destination system. While the full path is still required to get the message there, this information is held in map databases on a number of large systems and the actual addressing is done in software. Any system without sufficient map information to deliver a message simply kicks it upstairs to the next system up the line. This continues until it encounters one that can actually route the message.

The best known of the Unix networks is **INTERNET. ARPANET** was a Department of Defense experiment in shared resources begun in 1969 by the Defense Advanced Research Projects Agency (**DARPA**). It used **56 kbps** leased links to connect defense contractors and government research labs. It adopted a transmission protocol termed Transmission Control Protocol/Internet Protocol (**TCP/IP**). By 1988, **ARPANET** sported **40,000** hosts on **500** subnetworks.

Academic research labs were largely left out of the network. The **National Science Foundation** subsequently used the same **TCP/IP** protocol to expand the concept into a network of networks based around university computer systems. As of late 1988, **20** major supercomputers throughout the country were linked using **1.544 Mbps T1** circuits to form the Internet backbone that today serves over **150,000** hosts in hundreds of subnetworks. **DARPA** now intends to retire the original **ARPANET** soon. The large number of systems connected to Internet provided the impetus for the improved name domain addressing. The net carries some **20,000** messages daily.

Internet is perhaps best known from recent news events involving Robert Morris, a Cornell University student who unleashed a worm program which brought some 6000 Unix systems on the network some brief but major operational headaches.

In recent months, most of the popular public e-mail services, including MCI Mail, Western Union, CompuServe, SprintMail (formerly Telenet), and AT&T E-mail have added links to Internet.

The oddity is that Internet exists to connect things. The culture is based on eliminating the concept of information "haves" and information "have nots" by hooking everybody up. And they are most happy to connect to almost anything. As a result, there are ports into Internet from any number of sources.

Among the sources is the International Fidonet Organization. Fidonet is a worldwide network consisting of approximately **8000** BBS systems. Actually, you do not have to operate a BBS to be in Fidonet. You must simply operate a mailer program on an accessible modem during a couple of hours in the night. The program must be capable of performing a Fidonet mail session to swap messages. Each system is assigned a node number within a local geographic net. A master directory of all currently operating nodes is published electronically each Friday and spread throughout this network. This directory is referred to as the **NODELIST** and it is actually the heart of Fidonet. As a result, in theory anyone with a modem, computer, and mailer software can be part of Fidonet.

Sysops and other Fidonet members have a bit of a luxury. Then can send and receive messages as well as files simply by addressing them to someone in the net. The net/node number is required but it isn't too difficult and several of the software packages enable you to do this by name - the software actually looks up the net/node for you.

During the past year or so, a number of systems have been experimenting as gateways between Fidonet and Internet. All required is a local Fidonet system to establish a connection with a Unix system - usually at a university or commercial laboratory. There are some technical difficulties in bridging the two but more recently this was made easier by a program titled **UFGATE**, created by Late Night Software Company 671 28th Street, San Francisco, CA 94131; **(415)695-7727** voice; **(608)271-0687** data. The program allows DOS machines to perform Unix communications functions.

There are several entities that have come into being to provide a commercial Usenet connection for those unable to obtain them. Performance Systems International offers a connection for e-mail and Usenet News Groups at **$75** monthly. Performance Systems International, Inc., 11800 Sunrise Valley Dr., Reston, VA 22091; **(703)620-6651. UUNET** also provides some services including a 900 number connection. UUNET Communications, 3110 Fairview Park Dr., Suite 570, Falls Church VA 22042; **(703)876-5050** voice.

So the good news is that any Fidonet sysop, or any Fidonet BBS caller with access to ordinary netmail, can send messages to virtually anywhere. The bad news is that addressing is still a bit of a problem. But overall, operation is very good.

FROM FIDONET TO THE WORLD

To send an outbound message from a Fidonet BBS to any other service via Internet, you essentially send a message to UUCP. UUCP is the acronym for Unix to Unix Copy Program. In the **TO:** field of the message, simply enter **UUCP**. The BBS will reply with a request for a node number. Enter the net/node of your Unix gateway system.

In theory, each local net has a Fidonet gateway. In practice, many nets have none but the concern is that no net have MORE than one. For North America, Dr. David Dodell's **St. Joseph Hospital BBS Fidonet 114/15** serves as the default gateway for all nets that don't have a gateway. If you don't have a local gateway or don't know what it is, enter **114/15** as the net/node number.

To determine your actual local gateway, send an outgoing message to a friend on a commercial service and ask them to reply via Internet. Or log on to MCI mail and send yourself one addressed to a local Fidonet BBS you frequent. When you receive the message on the Fidonet system, the proper gateway for your network will be indicated on the message. Thereafter, please use that one.

Once you have addressed a message to **UUCP** via a **NET/NODE**, you will usually be asked for a **SUBJECT**. Whatever is on your mind will work here. You will then be prompted to enter the body of the message. This is where you actually put your intended recipients address. The address must be on the FIRST line of the message, flush left, and with nothing else on that line. To be safe, skip the following line. The address must include **TO:**, a space, the user name, the @ symbol, and the do-

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main. User names typically do NOT contain spaces between first and last although we've sent them successfully.

TO: jack.rickard@mcimail.com

After the address, skip a line and then begin your message.

TO MCI MAIL SUBSCRIBERS

Actually, MCI Mail will accept messages addressed in one of several ways: by name, by user logon, or by account number. The account number is ALWAYS the surest method if you have it. But it must be padded with three leading zeroes and the hyphen removed. For example, our account on MCI Mail is **418-7112**. The address would then be:

TO: 0004187112@mcimail.com

Finally, you can use the user name on MCI Mail. Ours is **jrickard:**

TO: jrickard@mcimail.com

Surprisingly, the last method didn't work for us. But it did point up how far along the system has come. While the message didn't make it to **jrickard** on MCI Mail, we did get a very informative message BACK to our Fidonet address from MCI Mail notifying us that there was a problem with delivery. It seemed there were TWO jrickards on the MCI service. Incredibly, they listed both of us in the error message along with our account numbers, full names, and city and state of residence and asked us to pick one and resend the message. Joseph T. Rickard, whoever you are, we salute both MCI Mail and you.

FIDONET TO COMPUSERVE

Sending a Fidonet message to a caller on CompuServe is slightly more restrictive. But CompuServe subscribers will likely not mind. Essentially, you must use CompuServe address account numbers much as you would on CompuServe itself. The one variation is that CompuServe accounts use commas to separate two segments after the fashion **71177,2310**. Recall that Internet addressing does not allow the use of commas. Simply replace the comma with a period.

TO:UUCP
NET/NODE: 114/15
SUBJECT: Test Message
TO: 71177.2310@compuserve.com

FROM THE WORLD TO FIDONET

Not only can you send mail to public e-mail services from a Fidonet BBS, you can also send messages from the public e-mail TO a Fidonet address. In fact, you can send e-mail to any known caller on ANY Fidonet system from a public e-mail service. Again, the key is in the addressing.

Let's examine an Internet address for a caller on a Fidonet system. This would be the Internet address for Jack Rickard on Fidonet 104 node 555.

jack.rickard@f555.n104.z1.fidonet.org

The basic form of the address, like all Internet domain addressing, is user@domain. In this case, the user is **jack.rickard**. Note that Internet addresses do not normally have spaces or commas. Internet addresses do not recognize case so all lower case letters are perfectly appropriate and in fact conventional in the Unix world. The domain in this case is

f555.n104.z1.fidonet.org.

The addressing runs left to right from more specific on the left to more general on the right. The **f555** is the specific node number within Fidonet - in this case, 555. The **n104** is of course the local geographic Fidonet network - in this case, net 104. **z1** is the Fidonet zone. Zone 1 is anything in North America. European addresses are zone 2 while Asian/Pacific is zone 3. Finally, the organizational domain is **fidonet.org**. Fidonet refers to the specific entity while **.ORG** is a classification. You may see several classifications in Internet addressing:

.COM Commercial service
.EDU Educational - usually a University
.GOV Government agency
.ORG Organization - a miscellaneous category that does include Fidonet

So our Internet address is as follows.

jack.rickard@f555.n104.z1.fidonet.org

The only real variables here for North American addresses are our name to the left of the @ symbol, our node (555), and our net (104)

FROM MCI MAIL TO FIDONET

On MCI Mail, simply enter the name of the recipient with (EMS) appended to it. This will call up an **EMS:** prompt. Enter **INTERNET** at this prompt. The responding prompt will be **MBX:** Enter the full Internet address at **MBX:**. At the next **MBX:** prompt, simply press the **ENTER** key.

TO: Jack Rickard (EMS)
EMS: Internet
MBX: jack.rickard@f555.n104.z1.fidonet.org
MBX: [press ENTER key at this prompt]

A message entered on MCI Mail to the above address reached our system in approximately 45 minutes.

FROM COMPUSERVE TO FIDONET

On CompuServe, addressing is a bit different, but not much. When sending a CompuServe message, you are first asked for the persons **NAME:** Anything will do as you are not going to use this to address anything. The next field is **ADDRESS:** Here, you must start the address with the greater-than symbol () followed by the word **INTERNET**, a colon, and a space, followed by the actual Internet address:

ADDRESS:>INTERNET:jack.rickard@f555.n104.z1.fidonet.org

A message left on CompuServe reached our Fidonet BBS in approximately 4 hours.

The bottom line is that by learning the vagaries of addressing, you CAN send e-mail almost anywhere. Unfortunately, addressing will NOT likely improve much in the near future. Those that spend the time learning addressing will be rewarded with virtually unlimited connections to whoever they wish to address. But for most, e-mail, at least on a worldwide scale, will remain unfathomable.

There is one remaining question - cost. For anyone with a Unix gateway in their local network, messages to MCI Mail, CompuServe, and any other domain in the Unix universe, there is no charge and no cost. This brings up an interesting and troublesome question. Who's paying for all of this? The answer is that the universities and government agencies participating in Internet do. And that largess, while it cannot continue indefinitely, poses some real problems in elimination.

The mail is passed from Unix system to system in quantities that are becoming considerable. In the past, this was considered part of the cost of participating in a network. But as the costs have risen, so have the questions. A storm broke out in the Hawaiian State Legislature last year over the costs the university was incurring in passing mail to and from the mainland. When legislators learned that much of this mail traffic was from individuals and businesses attached as points off the university system and that the messages often contained business and personal communications unrelated to education, the ax fell. Some large company systems are now estimating that it costs them in excess of a dollar to pass a single message through Internet. And by some estimates Internet is carrying some **20,000** messages per day - about **15 MB** of data. Actually, at the T1 transmission rate this is not as much as it sounds - roughly double Fidonet's traffic. But there appears to be no ceiling to message traffic.

And the history of the network has not included the development of a mechanism to charge individuals for messages. There is no accounting and no present mechanism to do so. Without it, Internet is headed for an economic Waterloo that appears unavoidable if not precisely imminent. In the meantime, most of the brunt is paid for by tax dollars and the generosity of a few large corporations. This is clearly not appropriate.

There are other elements of difference between the Fidonet world and the Unix world. One sore spot is echomail/newsgroups. There have been many efforts in the past year to marry the two with echomail appearing in Usenet News Groups and versa vice. The Unix world avoids duplicate messages by an absolute message numbering system. Fidonet allows each BBS to number messages and polices duplicate messages by fairly rigid control of the route an echomail conference takes through the network. The two systems are essentially incompatible. The entire Unix world essentially becomes a what is known in Fidonet as a "dupe loop". And there have been growing howls of rage within the Unix world regarding the duplicate echomail messages they are carrying as a result of the multiple entry points from Fidonet.

Eventually these growing pains will be worked out. In the meantime, we're fascinated with the new doors opening on electronic mail. We look forward to the day when sending an e-mail message from your desktop computer to another half way around the world is no more complicated than addressing an envelope for postal delivery. We'll write then mom - promise.

LONG DISTANCE USA

PC-OHIO: FROM SCIFI TO BIG BBS

by Lee Batdorff

Norm Henke's first exposure to computing was at Collinwood High School with a Dietzgen programmable desktop calculator which he played around with during lunch and after school. In 12th grade he took a chemistry course at Notre Dame College and used an HP programmable desktop calculator.

As a chemical engineering student at Cleveland State University he took several quarters of Fortran. After college he went to work as a chemist with Cleveland Crystals Inc. One of the other employees built a KIM 1 computer and brought it in. "This is the greatest thing since sliced bread", Norm told the computer owner. "I'd love to have one of these."

After looking at all the computers on the market at that time he bought an Apple II with one disk drive in January 1980. In 1982 he graduated to an IBM-PC with two single-sided drives. Soon after buying the IBM he decided to try making a living from PC's and quit his job as a chemist. He tried private consulting but found the pay steadier as purchasing agent at Computer Warehouse.

In early 1985 the only local Bulletin Board System available to PC users was the Cleveland RBBS. Getting on CompuServe was more expensive than calling long distance. He was an active user of some east coast BBS and accumulated 20 archived disks of shareware. A computer friend, Bob Abbott, said "You have enough software and expertise, you ought to start a BBS." At the time Norm worked at Computer Warehouse where he could purchase equipment at a special discount.

On September 1, 1985 he started PC-OHIO with one telephone line on a used TAVA XT clone in his bedroom. He began with RBBS but switched to PCBoard within a few months. In 1986 he expanded to three nodes (three XTs, two of them clones) and moved the operation into the dining room. Soon it expanded to five nodes and six computers in the living room. In 1987 he purchased an AT clone, ("Who could afford a real AT").

In 1988 "it was time to have some tiny feet running around the house," and he moved most of the computers to the basement.

Presently PC-OHIO operates on 15 computers in the basement and the main workstation in the first floor den within view of a TV. The computers are all linked together through an Ethernet network. He goes to the basement four or five times a day to check on things and spends evenings watching computers and TV. "The better the (TV) show the more TV is watched, the duller the show the more computer work is done."

Recently he upgraded to PCBoard 14.5 adding "a whole bunch of new features." The present nine nodes are "busy all the time." Late this summer he plans on adding six more nodes bringing the total to 15 nodes. "There is a real demand in the Cleveland area for a quality BBS." Almost one-half of the subscribers are from out of town, mostly out of state. "They call because our selection of files is large and up to date."

Most of the files are from voluntary uploads. "People want to share and we have reciprocal agreements with 250 other BBS operators." About twice a month he purges old versions of software. A couple of subscribers help with this. "Our subscription price is low with only a $30 annual fee for 60 minutes per day. Callers can use their time any way they wish. They are not required to do anything but enjoy themselves. Comparable BBS charge $50. There are only about a dozen systems in the country that are bigger. "When we go to 15 nodes this summer we will be in the top 10 in terms of size."

PC-OHIO has over 20,000 ZIP files. It contains over a gigabyte of actual files which could be unzipped to two gigabytes of real files. Each ZIP has five to ten files on average.

PC-OHIO consists of two Novell file servers running on 386-25 clones, five 12 MHz AT clones, five 386-20 clones and five 386SX clones. "We have two 670 MB Micropolis drives in the main file server and two 320 MB Miniscribe drives in the secondary file server for a total of 1980 MB on-line. We use USR HST 9600 bps modems on all our lines. The first five lines use the original HST and the last four lines are new HST DS modems. We think the HST DS is the best modem currently available. By next year all 15 lines will be HST DS modems."

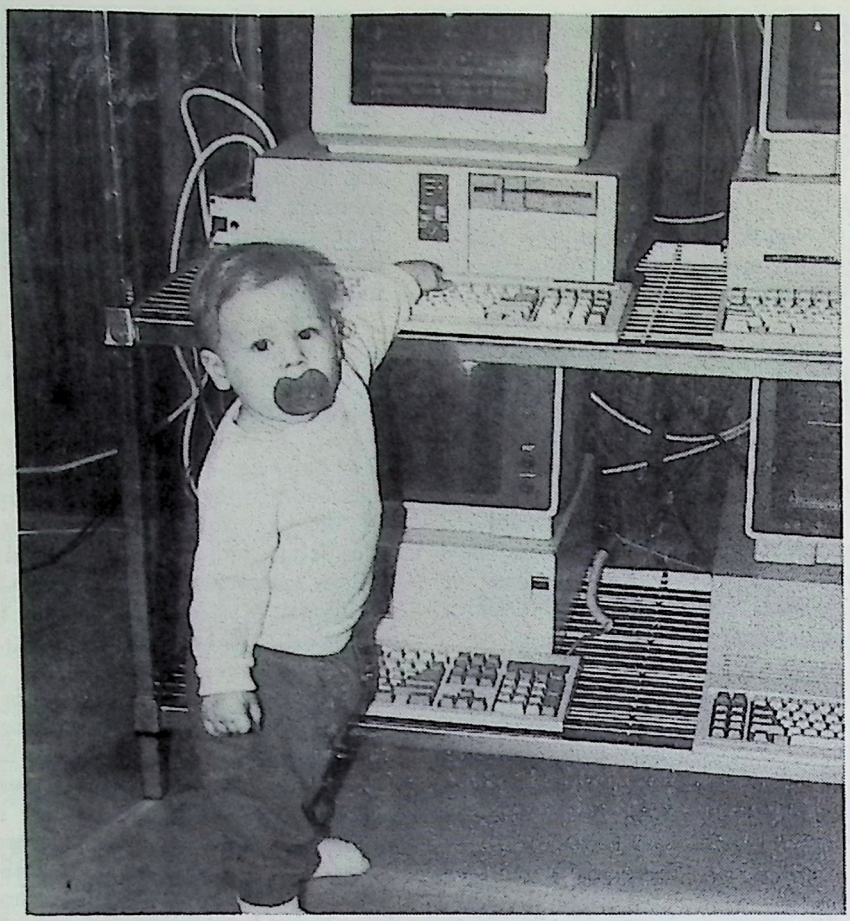
His long range plan is to have all 386-25 workstations. Next year he wants to upgrade the file servers to 486s.

PC-OHIO has about 1,200 subscribers plus 250 visiting Sysops and about 500 visitors who can only download a few files. It has contracts with two local user groups to provide BBS services to their members. It also has a monthly $300 phone bill, and $80 electric bill.

PC Ohio was recently voted #1 in the Hot 100/Nifty 50 BBS contest sponsored by Dan Bair's File Cabinet BBS, Computer Shopper, and Boardwatch Magazine. According to Henke, "It is rather ironic that I had originally decided not to enter the Best BBS in America contest, but when I learned that another local Sysop was campaigning for votes I had to get to work. Fortunately we have a very loyal group of subscribers who were willing to mail in ballots and vote for us. I was only hoping to be the Best in Ohio. I was really surprised when I saw that we were voted #1. It was a lot of work but it seems to have been worth it. Now we have to work harder to live up to our reputation."

PC-OHIO II is a separate system that Norm runs as a node in Fidonet. He is the Region Echomail Coordinator (REC) for Region 11 and Net Echomail Coordinator (NEC) for Net 157. PC-OHIO II is a mail-only system that handles all the echomail for Ohio, Kentucky, Indiana, Illinois, Michigan and Wisconsin. Over 400,000 messages pass through 157/200 each week. PC-OHIO II is also a Point net for 40 individuals in Cleveland.

After working at Cleveland Crystals, Computer Warehouse, Software Connection, and Sohio, he has been with Systems and Computer Technology (SCT) at Cuyahoga Community College for two and half years as senior micro repair technician.



PC Ohio BBS technical director Colin Henke making a few adjustments.

"SCT is the contractor that runs the Computer Center at CCC. They hired me to help start a Micro Repair Center for all the PC equipment at the college. My department of five people is responsible for the installation and maintenance of the over 2000 computers that the college owns on three campuses. It is a very interesting job because I get to test and evaluate new equipment and software. Part of my time has been spent writing a Workstation Standards manual which will be used to guide PC purchases for the next five years."

He was self taught by reading and hands-on experience. "At the peak I was subscribing to 20 computer magazines. Now I'm down to about eight. These are PC Magazine, InfoWorld, Computer Shopper, PC Week, Byte, PC Resource, Boardwatch and LAN magazine. Everything else I've let run out. InfoWorld is the most up to date. PC Magazine has the best reviews. I'm keeping the Byte subscription partly for sentimental reasons; I have a complete collection from issue #1."

"Even though we have one of the largest computer markets in the country we don't have any big computer shows or other major PC activity in Cleveland. I read somewhere that there is a very advanced level of PC purchases by companies in this area and that Cleveland has one of the highest ratio of computers to workers of any place in the nation. We're rapidly approaching a one-to-one ratio of employees to computers in the large corporations here."

Norm is a lifetime member of the Northeast Ohio Apple Corps awarded to him for many years of distinguished service. At various times he was the club president, secretary, treasurer and newsletter editor. He carries a brass membership card. Even so, he said, "I think the PC world will continue to be dominant over the Mac world. The graphical user interface will be important for this, such as Windows 3.0. Already there is graphics software on the PC as good as or better than on the Mac. You can buy a PC to do the same things for a lot less money. Many businesses are not comfortable going with a machine that has only one source."

A resident of South Euclid, Ohio, Norm is 36-years-old and has been married to his wife Joyce for 14 years. She is a registered nurse at the Cleveland Clinic and keeps an eye on the BBS when he is not home. She has restarted the whole network a number of times after power failures outlasted the battery backup. She also handles some of the voice phone calls. They have a one-year-old son, Colin. Norm's major non-computing interest is science fiction which started in the seventh grade. He has a collection of 2,800 paperback books. He is a big fan of Doctor Who and Star Trek. Science fiction lead to the computer interest. He used to be interested in photography and tropical fish but the computers have taken over.

"One of the things I would like to see is to network everybody's computers together. Some day we'll have on-line directories for stores and businesses. For voting, we'll be able to call up a biography on everyone running for office and actually vote for your candidate from home. If you have some easy way to get this information you are more apt to make an intelligent decision.

"There is a long range goal of converting the Library of Congress to electronic media. You'd be able to get anything (information) in the world (on that system). What we need to do this is Bell's Integrated Services Digital Network (ISDN). This gives you three high-speed digital channels directly into your home. The advantage is that you do not need a modem. You could hook up with PC-OHIO at 64,000 bits per second. Presently the maximum rate is at 9600 bits per second."

[PC Ohio was voted #1 in the recent Hot 100/Nifty 50 Contest. Mr. Henke is shown on our front cover in this month's issue. - Editor]

NETWORK WORLD MAGAZINE BBS

Network World - The Newsweekly of User Networking Strategies - is a weekly tabloid published by CW Communications, parent organization of a whole series of "Worlds" covering the PC industry. Published in Framingham Massachusetts, Network World covers Local Area Networks (LAN) and Wide Area Networks (WAN) from the perspective of Management Information Services (MIS) directors at large, obnoxious corporations.

The weekly features lots of news of products and strategies for dealing with the growing, sprawling, troublesome world of local area networking. It also covers enough of the telephone network and issues involved with connecting LANs to each other and to the world, that we find it interesting reading.

Pete White of GW Associates recently introduced them to a bit of an eye opener - a BBS system. He installed a system for them based on eSoft Inc.'s The Bread Board System (TBBS) Information Manager. He did convince them that there were in fact usable **9600 bps** modems available in the world and that half the nation was connected using these BBS software programs and modems. It's a world somewhat different from LANs and bridge routers but not so much so really.

The **Network World Bulletin Board System** is now in operation at **(508)620-1160** at speeds up to **2400 bps** and **(508)620-1178** for **9600 bps V.32** callers. The service is a bit spartan now in the initial stages with one message area, no file areas, and a simple survey allowing you to apply for a free subscription to the magazine. Network World is what is termed a "requester" publication. Anyone who fits their target market criteria that requests a subscription receives one at no charge.

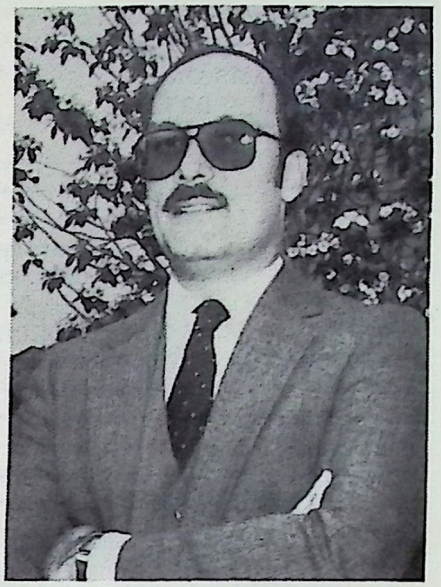
The service exists to allow readers to send letters to the editor, pass on story tips, and send suggestions for improvement. But Pete White did something a bit cunning. The paper is actually created on Atex publishing system terminals. White linked the publishing system to the BBS using a null modem cable. As such, the staff can very easily logon to the system from their workstations by entering a couple of simple commands.

Most BBS started by large organizations tend to have a single "champion" who recognizes the value of an online presence for the company and causes it to happen. Everyone pretty much agrees it would be a good idea and it is installed. After the initial introduction and "gee-whiz - we're something technical now" comments, most everyone, with the exception of this champion, goes back to work doing what they always did. Participation from outside the company is often wildly more active than among the internal staff. By making it truly easy for Network Worlders to logon from their own workstations, White dramatically increased the chances that the system will actually be used internally and that you can actually contact a particular editor via the system.

As we said, there is virtually nothing on the BBS but a single message conference area and a private e-mail function. We thought we'd take a peek before hitting the ALT-H key to end their existence from our point of view. But instead we spent 30 minutes reading through the traffic. It seems there are several editors actively engaging some very knowledgeable readers in serious discussions of networking issues. How exactly would you define a LAN site? By CPU? Building? City? Company? Which is better for a certain application, Token Ring or Ethernet? A lot of interest in connecting existing LANs through the public switched telephone network. We even found some discussion of which long distance carrier offered the best charge card deal (Telecom USA - $0.30 per call, national 800 number, and some very innovative voice mail forwarding features).

There was none of the vacuous, ego-charged posturing so common in many message conferences. Just a very lively participative exchange of technical strategies for networking - very much in keeping with the theme of the publication. If you are struggling with some of these issues, you might find the group of callers assembled here a valuable resource. Network World, 161 Worcester Road, Framingham, MA 01701; **(508)875-6400.**

HAKALA AT LARGE



C.A.R.L. SERVICES EXPLODING

by David Hakala

We in the High Country are blessed with one of the finest publicly-sponsored online systems anywhere: the Colorado Alliance of Research Libraries, affectionately known as CARL. It links public, college, law, and medical libraries all over the state, providing convenient access to over **4 million** citations and full-text articles online and at no charge.

Anyone with a modem can log in to this treasure chest; so far, the mileage record-holder is a researcher from Australia. CARL has also attracted out-of-state information providers, like the Boston College & Public Library catalogs. Grolier's American Encyclopedia is back online, along with an exciting innovation from UnCover, the document delivery service.

UnCover is a business and industry abstract database that can also deliver full-text articles as ASCII displays or via fax transmission. The former must omit charts, pictures and other graphics, but fax will provide "the works." CARL users can simply enter a credit card number to receive the article of their choice by one means or the other. ASCII displays cost **$3.00**, fax **$8.00.**

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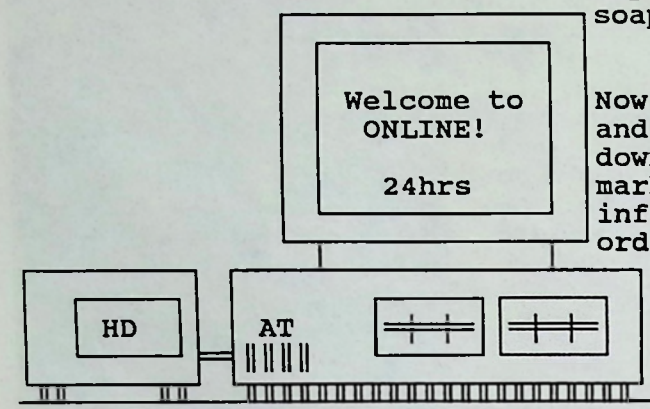


Now that you have some idea of what this is and want to know more call my utility bbs and download soapopra.zip. This will help you market this to the women and has ordering information and a sample setup. So call and order your's now.

* All 12 Soap Operas
* Marketing help
* Set up info.

CARL has added a plethora of specialized public information databases, including the Environmental Education resource guide. I found such exotic items as public hearing announcements from Rocky Flats and an environmental employment service (with its own BBS) in Fort Collins.

Business and economic indicators are provided, along with a database of full-text articles on Colorado's business and political luminaries. The Greater Denver Chamber of Commerce membership directory is online. So are statistics on the state's largest industries and employers.

CARL's backbone is still local library catalogs. You can not only learn whether Richard Brautigan's "Trout Fishing in America" is at your local branch, but whether it is checked out at this time. Saves many a wasted trip to the library.

The CARL system is a fine example of tax-supported information utilities. We wholeheartedly commend its sponsors and recommend you give CARL a call.

CARL Systems, Inc.: 777 Grant St.,Suite 306, Denver, Co. 80203. Voice:303-861-5319. Data:303-863-1350. Internet:help@carl.org

THE WIZARD OF EVERGREEN

by David Hakala

Mark Cook's Wizardry BBS (303-670-1416) is one of my daily stops. If it wasn't a local call from Denver, my phone bill would look like a car payment. Running Remote Access on a fast 386, the board is elegantly designed and immaculately maintained. Cook keeps over 120 MB of shareware and GIF graphics online, along with an ever-changing variety of interactive games, online databases, matchmaking doors and many other whimsical as well as useful items.

He also belongs to several local and national echomail systems, offering over 50 topic areas. SDN, the Shareware Distribution Network, keeps Wizardry well stocked with the latest programs obtained directly from the authors. When I need an exotic item, I look first on Wizardry.

The problem with such a gem of a BBS is busy signals. Wizardry just added a second line for subscribers only ($25/year), while keeping its open-access policy for nonsubscribers on line 1. Now I don't have to call at 5:00 a.m., at least until line 2 fills up. Line 1 is answered by a 2400 bps Zoom modem, line 2 by a 9600 bps US Robotics HST.

Cook is also launching his first unique shareware products this month, under the trade name WizWare. Both should do very well indeed.

RequestWizard is a user-oriented File Request system. It gives Wizardry callers access to the file collections of nine other BBS. (The software's capacity is 300 file lists and BBS phone numbers.)

In the unlikely event I don't find what I need in the local directory, RequestWizard will tell me if another system carries the program I need.

Instead of fighting busy signals to get to that board, I simply request the file as if downloading it from Wizardry. My file request is transmitted to the remote system during automatic routines run several times a day. I call back later and RequestWizard immediately tells me what programs have been retrieved. Then it's just a local download.

F'Reqing ("freeking"), as file requests are called among sysops, used to require some technical expertise with BBS and netmail software. Many sysops try to oblige their callers by processing F'Reqs for them, but it is a hassle for the sysop. RequestWizard totally automates the process in its registered ($25) form. The unregistered version is fully functional, except the sysop must enter a key code to initiate each F'Req session.

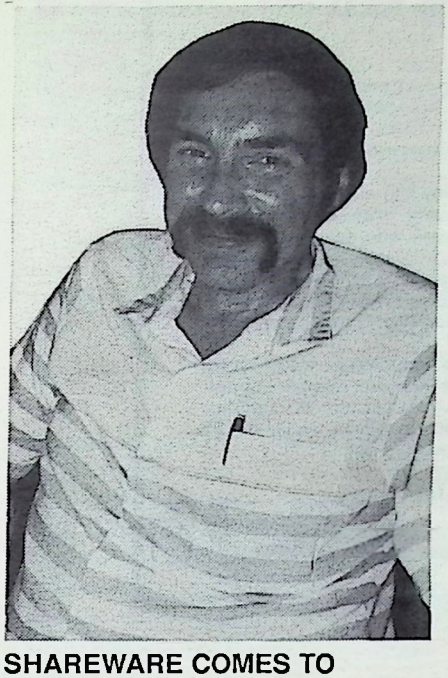
Since he replaced QuickBBS with Remote Access, Cook has developed several multi-node programs to deal with the new environment. The first one ready for release is "Door Vs. Nodes," which simply keeps track of which external programs are in use on a multiline Remote Access system and denies callers on other lines access to the same program until the current user leaves it. Sounds almost trivial unless you're a sysop, and have tired of rebooting your system because two callers collided in the same door.

Cook, who just got his driver's learning permit, may well be the heir apparent to Adam Hudson's title of Teenage BBS Guru. Cook is adept in Turbo Pascal, and is always willing to take a crack at "impossible" programming assignments. He has a natural instinct for menu design.

Wizardry is a rich, complex treasure house, but it is nearly impossible to get lost or confused on it. Cook's use of ANSI graphics is downright artistic: eye-catching, not eye-stabbing.

Cook is available for online-advertising and BBS design work, system purchasing and integration, or to mow your lawn. Just leave a message on Wizardry. Better catch him this summer, though. When the school year starts, he'll be dividing his junior year between Evergreen High School and the Colorado School of Mines. Then M.I.T. beckons. Wizardry BBS: Evergreen CO. Data:**(303)670-1416**, 2400 8-N-1

DR. FILE FINDER



SHAREWARE COMES TO COMDEX

by Mike Callahan and Nick Anis

After finishing my 1200 page compendium on shareware, my co-author Nick Anis dragged me off to the Tenth Annual COMDEX/SPRING'90 show held in Atlanta the first week of June at Georgia World Congress Center and the Inforum. I don't get out much, I prefer to do my traveling on the "wires".

It was only last November that I attended my first COMDEX/FALL'89 in Las Vegas. I was overwhelmed by the 1,700 exhibitors there spread out over 8 or 9 locations. Covering a over a million square feet of exhibit space can be tiring. COMDEX publicists for years have hyped what they call "miles of aisles," - they ain't kidding!

One of the things I notice at the COMDEX/FALL'89 was the noticeable lack of shareware exhibitors - with the prominent exception of Automenu's Marshall McGee who has exhibited since 1986. Bob Wallace, one of the founders of shareware, has also been exhibiting at COMDEX/FALL over the years with his PCWrite and other products. I of course noticed the folks at U.S. Robotics had an elegant booth and one of the hottest COMDEX parties going - second only to the Dvorak bash. Jack Rickard did an excellent job of filling us in on that show. I'm going to take a stab on giving you the scoop on COMDEX/SPRING'90.

First of all, Atlanta-based Marshall McGee had his firm, McGee Enterprises in an excellent booth on the main floor. Among his staff of a half-dozen or so I was surprised to find Ward Christensen, the father of XMODEM and perhaps BBS's. He looked neat and trim and when I mentioned XMODEM he said: "Oh, that hack job. I knocked that off in an hour or so."

I took a run over to the Inforum about two blocks and a $4 flat-rate cab ride away and much to my chagrin, there was Phil Katz and the PKware gang. I got a PK keychain, a PK opener, a PK demo disk, and a PK greeting. Phil is an unpretentious, gracious fellow who spent most of the show dutifully explaining data compression to folks that passed by. One thing I noticed was that middle management people from firms like Texas Instruments and IBM were coming by just to meet the guy who wrote PKZIP. A lot of people who stopped by said things like way to go Phil! PKZIP is hot stuff.

Only an aisle or two over was Sammy Mitchel and his lovely wife Bobby at the Semiware booth. They had an impressive demo of Qedit and Qedit TSR that was done entirely in Qedit's macros. These guys are also Atlanta based.

A little over 60,000 people attended this show and many of them found out about shareware for the first time. The significant thing here isn't just shareware being treated as part of mainstream computing. It's that these guys have made a commitment to put their shareware products into the corporate and dealer reseller market place. This is going to mean they will have to get a little more businesslike and clean up their packaging, manuals and so forth. Qedit's package for instance looks sharp.

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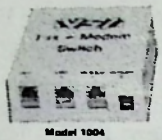

FMX connects FAX and Modem to same phone line. Automatically routes incoming calls to FAX or Modem. Requires no action by sender or receiver.

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800/999-8232, FAX 714/687-2513

VSI

But not to worry. Our friends are not turning their back on shareware. They are simply expanding their business into other markets. I say good luck to them and much success. We've all used their products for years and they deserve to reap some benefits for the efforts.

I'm looking for a new pair of "walking shoes" and getting estimates for a motorized cart for COMDEX/FALL'90.

NEW QMODEM 4.2 COMMUNICATIONS PROGRAM RELEASE DUE.

by Mike Callahan.

Telecommunications is a fascinating thing. You boot your computer, bring up your communications program, and a whole new world opens up to you. You can go online and participate in conferences, read the news, and download some of the excellent Shareware programs that are available.

In order to get involved in these things, however, you need a good, solid communications program. This article covers the just released QModem version 4.2 by John Friel and The Forbin Project. Overall, I consider QModem to be the best communications program that you can buy. Let's take a look at just some of the great features and functions that you'll find in QModem.

To begin with, QModem is a communications program that starts you out in 'terminal' mode. You are in control and the world of telecommunications is at your feet. From the very beginning, QModem is designed to be flexible. You determine what the default values are for virtually every aspect of the program: baud rate, parity, stop bits, data bits, and Comm port. A special setup menu lets you configure the modem settings, the terminal settings, the way the program handles ASCII transfers, and more.

In QModem 4.2, the configuration menu has been subdivided into smaller, more manageable parts. This allows you to configure various aspects of QModem quickly and easily. QModem is the most flexible communications program available ... adapting itself to a wide range of system hardware. QModem allows keyboard macros and in this latest version, you can have as many different sets of macros as you want.

The program has a built-in modem configuration function that will easily configure some of the most popular modems. This is an excellent feature for all users, but especially those who are new to telecommunications. Setting up initialization strings can be a daunting task for the novice. With QModem, you highlight the name of your modem, or one like it, from a popup selection list and the program tells you how to set any needed hardware switch settings for that modem. It will also automatically determine the initialization string that needs to be sent to the modem ... and will send it! If your modem has NRAM (Non-Volatile RAM), QModem will write the default settings to NRAM for you. Really a slick feature.

You can tell QModem to use EMS (Expanded Memory) for swapping the overlay file, and much more! These are just a few of the things you can configure to make QModem work the way you want it to. Best of all, these functions are all available in pop-out windows. How do you keep track of all of the different commands? With a pop-out menu, of course. Virtually all of QModem's commands are available in easy to remember keystrokes. For example, to access the Dialing Directory use ALT-D, the menu to change Parameters is gained by using ALT-P, and so on. It doesn't take long before you know all of the keystrokes. So, QModem 4.2 is not only flexible, but easy to use. It can be configured to meet your needs. There's much more.

The vast majority of people use telecommunications for transferring data in one form or another. This is another area where QModem 4.2 really has you covered. With just a few key strokes, you

can open a capture buffer, give it a unique name, and begin logging data right off the screen. If you want, you can capture just one screen by doing a "screen dump." Miss something that scrolled off of the screen? QModem has a scroll-back buffer and you configure how large it will be. If you like, you can even save the entire contents of the scroll-back buffer to a disk file.

These are all extremely useful tools for capturing data, but what about sending data? What about getting some of those great Shareware programs or communicating on bulletin boards and online networks?? Well, once again, QModem 4.2 offers you more total flexibility than any other communications program.

For doing file transfers, both uploads and downloads, QModem 4.2 offers you nine different internal transfer protocols. The latest addition in version 4.2 is internal ZMODEM. You can configure QModem to automatically begin ZMODEM downloads. Just select ZMODEM on the system you are on, and tell the system the name of the file(s) you want to download. That's all you have to do because QModem's ZMODEM will start the transfer automatically. You can also watch how your transfer is doing on a 'file transfer screen' that shows you the blocks and bytes transferred, the average CPS (characters per second), if any errors have occurred, and much more. And... QModem's implementation of ZMODEM is faster than any other implementation of ZMODEM I've tried.

You can also add up to ten 'external' protocols, like Puma, (soon to be renamed MPt.) Bimodem, SEAlink, and others. By giving you the freedom to add these external protocols, rather than having them built-in, you can be sure of always having the most recent implementation of each protocol. From my experience, there isn't a network or a bulletin board system in existence where QModem won't be able to give you at least one means of transferring a file.

There are a couple of other things that QModem 4.2 offers that you won't find in most commercial programs. First of all, QModem has a "HOST MODE". You can set this up like a mini bulletin board and let your friends and colleagues call into your PC. The Host Mode offers uploading and downloading of files, a 'chat' capability, and the ability to send and read messages. Another great feature in QModem's Host Mode is that you can decide what file transfer protocols will be available. Any protocol, either internal or external, that QModem uses in "terminal" mode can also be available in "Host Mode."

By now, you've probably gotten the idea that QModem 4.2 is a really comprehensive and flexible tool for all of your various communications needs. Well, you're right. In this latest release of QModem, however, there are some extra nice features, like a powerful batch upload function! This function will allow you to enter up to 75 file names from directories all over your system. You can even use wildcard specifications. QModem's new batch upload facility is smart too! If you specify a file for upload that does not exist, QModem let's you know.

QModem also has a "QuickLearn" script function that will automatically create "log on" scripts for you. In addition, QModem's script language can be used to automate the time you spend online, thus saving you time and money. Let me tell you just a bit more about QModem's powerful script language.

Other communications programs have command languages, but the script language included in QModem 4.2 is really dynamic. If you subscribe to some of the big networks, you can use the script language to completely automate the tasks of collecting and even sending electronic mail. I use QModem's script language to help automate my access to Starlink. Scripts can be made to create menus, to branch to different places depending on various results, and much more. The possibilities are limitless. And ... by using the script files, you can greatly reduce the time you spend online. That means you save both time and money. The script language in QModem lets you do it all. You can even create script files that perform uploads and downloads automatically.

Nearly all communications programs let you 'Shell' to DOS. What you can do when you get there depends on how much memory is left over. QModem 4.2 has addressed that problem too. QModem now has a dynamic shell feature that spins out QModem to either disk or Expanded Memory (EMS). This leaves QModem occupying only around 4,000 BYTES of memory! You can run another program, unpack compressed files, or anything else and never get a "Not enough memory" message.

Well, I hope I've given you a fair idea of just some of the things that QModem 4.2 can do. It's flexible, it's easily configured, it's dynamic, and it offers the best in file transfer protocols. There are lots of other things I could tell you about QModem, but you'll have to see it to believe it. Give QModem 4.2 a try, you'll be glad that you did. Here's hoping you enjoy your travels in "The Wires".
Take Care.....
Dr. File Finder

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NATIONAL LIST OF ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - AUGUST 1990

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ADA Information Clearinghouse	(202)694-0215	. Information on ADA Programming Language/Military Specs	Department of Defense	Washington ,D.C.
ANARC BBS	(913)345-1978	. World Radio/TV Handbook - Short Wave Freq Lists/Scheds.	Assoc. of North American Radio Clubs	,KS
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AST Technical Services BBS	(714)727-4723	. Superb support system for AST Computer Products	AST Research Inc.	Irvine ,CA
AT&T Support BBS	(201)769-6397	. Support for PC 6300 and Other AT&T PC Models	American Telephone/Telegraph PC Division	Plainfield ,NJ
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Best Friends BBS	(714)832-5902	. DLX Multiline Chat/Match Social/Sexual	Ann and Joe Wiseman	Fountain Valley ,CA
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Big Sky Telegraph	(406)683-7680	. Education/Econ Development info to Montana rural Communities	Montanna Rural Education Network	Dillon ,MT
BMUG BBS	(415)849-2684	. Support for Macintosh owners - files - conferences.	Berkeley Macintosh Users Group	Berkeley ,CA
Book BBS	(215)657-6130	. Information on 2000 Computer Books - 800 order number	Business & Computer Book Store	Willow Grove ,PA
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Brown Bag Software BBS	(408)371-7654	. Power Menu/ PC Outline Software Support	Brown Bag Software	Campbell ,CA
Bruce's Bar & Grill	(203)236-3761	. 24-line Social System - Chat - Games - Downloads	Bruce Lomasky	West Hartford ,CT
ButtonWare BBS	(206)454-2629	. PC-File dB / PC-Calc / PC-Type Software Support	Jim Button/ButtonWare	Bellevue ,WA
C.A.R.L Library Service	(303)863-1350	. Citations to 2 Million Texts in Colorado Library System FREE	Colorado Alliance of Research Libraries	Denver ,CO
Canada Remote Systems	(416)232-0442	. Probably Canada's largest BBS/Online Information Service	Jud Newell	Toronto ,Ontario
CatHouse BBS 206/2901	(805)395-0650	. Multiline Support System for Wildcat BBS Software	Mustang Software	Bakersfield ,CA
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Census Bureau Personnel Division	(301)763-4574	. Employment Opportunities Within the Census Bureau	US Dept. of Commerce/Nevins Frankel	Suitland ,MD
Channel 1	(617)354-8873	. Thirty-line PCBoard System - 2.5 Gigabytes	Brian Miller/Tess Heder	Cambridge ,MA
Chicago SysLink	(312)622-4442	. Special Interest Areas for Ferret/Pet Owners.TRS80/Aviation	George Matyaszek	Chicago ,IL
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Clean Air BBS	(408)298-4277	. Environmental Health/Cigarette Smoking Topics	American Lung Association/ Sheila Blash	San Jose ,CA
Cleveland Freenet	(216)368-3888	. Cleveland City Information/Ohio Governor's Office Online	Case Western University/AT&T/Ohio Bell	Cleveland ,OH
COCONET	(619)456-0815	. San Diego Movies/Plays/Theatres Online - Requires Software	Brian and Patricia Dear	La Jolla ,CA
Computer Business Services	(714)396-0014	. Computer Columnist John C. Dvorak's office BBS	John C. Dvorak and Nick Anis Jr.	Diamond Bar ,CA
Computerized Bulletin Board Sys	(708)849-1132	. First Electronic Bulletin Board - Creator of XMODEM Protocol	Ward Christensen	Chicago ,IL
Computing Canada Online	(416)497-5263	. Adjunct to Excellent Canadian PC Newspaper	Computing Canada Newspaper	Willowdale ,Ontario
Corporate Data Exchange (CDX)	(609)683-4422	. PR Newswire/ Business Wire. Logon: hello user.cdx	LaFountain Research Corp/Tad LaFountain	Princeton ,NJ
Crosstalk Communications BBS	(404)740-8428	. Product Support for Crosstalk for Windows/MK4/XVI	Digital Communications Associates	Roswell ,GA
CTC IEEE Employment Database	(508)263-3857	. Online Database of 20,000 Resumes for Engineering	Career Technologies Corporation	Andover ,MA
Cul-de-Sac Bar & Grill	(508)429-1784	. Multiline Service - Ham Radio - Humor - Echomail - Games	Pete White	Holliston ,MA
Dante Project BBS	(603)643-6310	. Commentary/Research on Dante's Divinia Comedia	Dartmouth College	Hanover ,NH
Data Point	(501)442-8777	. Online Publications - Excellent TBBS System	Gary Funk	Fayetteville ,AR
DataLink RBBS System	(214)394-7438	. Weather Satellite Imaging, NOAA Satellite Tracking-AMSAT-NA	Dallas Remote Imaging Group/Jeff Wallach	Carrollton ,TX
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Dr. Dobbs Listing Service	(603)882-1599	. Source Code from Dr. Dobb's Journal, MIPS, and DBMS Mags.	M&T Publishing/Computer Metrics	Redwood City ,CA
Economic Bulletin Board	(202)377-0433	. Economic Statistics/GNP/CPI/Employment, Trade Opportunities	US Department of Commerce	Springfield ,VA
Eesti BBS #1	7 0142 422583	. First BBS in USSR - Estonian Business Issues	Lembit Pirn/Estonian Business Assoc.	Tallinn ,Estonia
Energy Info Admin E-Publications	(202)586-8658	. Variety of Petroleum/Coal/Electricity Energy Statistics	US Department of Energy	Washington ,D.C.
EXEC-PC	(414)789-4210	. Largest BBS in US - 90 Lines - 70,000 files - 4 Gigabytes	Bob Mahoney	Shorewood ,WI
Executive Network	(914)667-4567	. Interlink Netmail National Host - Multiline PCBoard System	Andy Keeves	Mt. Vernon ,NY
Farwest BBS	(604)381-3934	. Large Western Canada Galacticomm Info System	Ren L'Ecuyer	Victoria ,BC
FCC Public Access Link	(301)725-1072	. Equipment Authorization Status Advisory Service	Federal Communications Commission	Columbia ,MD
Federal Job Information Center	(313)226-4423	. Federal Job Opportunity Lists available online	US Office of Personnel Management	Detroit ,MI

File Cabinet BBS	(215)678-9854	10-line PCBoard System. 959 MB-100 Conferences-80,000 files
FOG City BBS 125/10	(415)863-9697	Gay Community BBS - AIDS Info - Desktop Publishing - MACs
Forbin Project, The	(319)233-6157	Home of QModem SST Communications Software
GAO Bulletin Board	(202)275-1050	Lotus/dBase/Word Perfect User Tips
GLIB	(703)578-4542	Gay and Lesbian Information Bureau - 11 Lines - 9600 bps
Greenpeace Environet	(415)861-6503	Ecological and Peace Issues - Disarmament/Toxics/Wildlife
GT PowerComm BBS	(713)772-2090	Home of GT Power Communications Software
Hay Locator	(317)494-6643	Database of Hay/Straw Suppliers and Buyers
Hayes Advanced Systems Support	(800)874-2937	Customer Support Line for Hayes Customers. V-series/Ultra
Herpnet/Satronics TBBS	(215)698-1905	Reptile and Amphibian Studies - Poison Snakes/Toads/Fish
IBM Users Group Support BBS	(404)988-2790	IBM PC User Groups Database - Newsletter Exchange
Imaging GraphicsLine BBS	(415)968-1834	Paradise/Verticom Graphics Products - .GIFs
Inbound/Outbound	(212)989-4675	Telephone Sales Publication Online Service
Infinity World	(606)271-6556	8 line Galacticomm System - Many good text publications
Intel Support BBS	(503)645-6275	Support for Intel PC Products - Inboard 386/AboveBoard 286
Invention Factory	(212)431-1194	27 Lines - 100 Directories - Good Shareware Catalog
Investor's Online Data	(206)285-5359	Online Investment/Stock Market Information/Tech Analysis
JAG-NET	(202)325-0748	Navy Judge Advocate General's Information Network
JDR Microdevices BBS	(408)559-0253	Online Hardware Order - Catalog - 1.1 GB Files - Quizzes
JOBBS	(404)992-8937	Online Job Listings - 2186 Technical Pos. - 10,000 Corps.
KIMBERELY BBS	(612)340-2489	Prime Rate-Fed Funds-T-Bill-Discount Rate-Economic Data
LANtastic BBS	(602)293-8065	Support for LANtastic local area network
Leading Edge Auto Info Line	(508)836-3967	Support for Leading Edge Computer Owners
LegalEase	(509)326-3238	Legal issues/Forms - Law BBS List
LUMINA	(612)626-2206	Libraries of Univ.of Minnesota Integrated Net Access7E1VT100
Maxi-Micro TickerScreen	(212)809-1160	2000 Closing Stock Quotes/Market Research/Order Entry
Micro Foundry, The	(415)598-0498	520 MB Downloads - Growing to Become the Best - Boardwatch
Micro Message Service	(919)779-6674	USA Today/Boxoffice Magazine - Large Download Area
Microlink B	(303)972-9600	1 Gigabyte of IBM Software - Multiline - USA Today News
Microrim Technical Support BBS	(206)881-8119	Support for Popular R:Base Relational Data Base System
Minnesota Spacenet	(612)920-5566	Minnesota Space Frontier Society - NASA News
Monu-CAD BBS	(607)264-3307	CAD Designs for Tombstones, Monuments, and Memorials
MusicNet	(301)946-6796	CD Catalog, Music News, Music Files, Top 40 Listings
NARDAC BBS	(804)445-1627	Zenith Computer Support - List of Federal Micro User Groups
NASA Spacelink	(205)895-0028	NASA Educational Affairs Div. - Flight Data/Space History
Nashville Exchange	(615)383-0727	8 line TBBS - Games/TDBS Software Development
National Agricultural Library	(301)344-8510	Agricultural Info/Research Resources
National Genealogical BBS	(703)528-2612	Family History - Genealogical Research - Gravestone Haunting
National Inst.Science Technology	(301)948-5717	Micro Elect.Info Exchange - Virus Protection/Security Issues
National Publishers Exchange	(813)989-1087	Headquarters for NPE Newsletter - Desktop Publishing
Nautilus BBS	(316)365-7631	32 Line TBBS with 5 GB of Files on 80486. CD/WORMS
NAVWESA	(202)433-6639	Naval Weapons Engineering Support
Network World Bulletin Board	(508)620-1178	LAN and WAN Issues and Technology
NIST ACTS	(303)494-4775	Automated Computer Telephone Service - Sync PC to NBS Time
NOAA Space Environment Lab	(303)497-5042	Solar Flare/Geomagnetic Data Online
Numisnet	(301)498-8205	Collecting of Coins, Medals, and Exonumia
OERI BBS	(800)222-4922	Educational Statistics and Data - Performance Stats -
Old Colorado City Communications	(719)632-4111	Political Discussions - Unix UUCP Public Access - Multiline
Online Now	(807)345-5522	5 CD-ROMS plus 3MB New Software per Week
Online Sports	(716)688-6537	Large base of Sports Stats for Pro Gamblers
Online With Hayes	(404)446-6336	Hayes Public Bulletin Board - Conferences/SIGS/Support
Oracle PC	6108 260-6222	South Australian TBBS Multiline System
Osprey's Nest	(301)989-9036	Birdwatching, Bird feeding, Naturalist/Ecology Issues
PacComm BBS	(813)874-3078	Packet Radio Equipment Supplier - TNC/PSK Modems
PC Ohio	(216)381-3320	Shareware library with 100% USR HST access - 5 years up
PC Pursuit Information	(800)835-3001	Unlimited LD Calls to 34 US Cities - $25 Flat Monthly Rate
PDSLO BBS	(516)938-6722	Home of THELIST - Listing of 3000 Nationwide BBS Systems
PHYSICS Forum BBS	(413)545-1959	Physics and Astronomical Sciences
PKWare BBS	(414)352-7176	Home of PKZIP 1.10 Compression Utility

Dan Bair	Wyomissing ,PA
Bill Essex	San Francisco ,CA
John Friel III	Cedar Falls ,IA
US General Accounting Office/Sheryl Lee	Washington ,D.C.
Community Educational Svcs. Foundation	Arlington ,VA
Dick Dillman/Greenpeace	,
Paul Meiners/P&M Software	Houston ,TX
Purdue Univ. Agricultural Computer Net	,.
Hayes Microcomputer Products	Norcross ,GA
Mark Miller	Philadelphia ,PA
IBM National Support Center	Atlanta ,GA
Western Digital/Nan Coley	Milpitas ,CA
Harry Newton Publications	New York ,NY
Daniel Diachun	Lexington ,KY
Intel Corporation PCEO Division	Hillsborough ,OR
Mike Sussell	New York ,NY
Don Shepherdson	Bellevue ,WA
US. Dept. of Navy / Chris Buechler	Arlington ,VA
JDR Microdevices	San Jose ,CA
Alpha Systems Inc./Bill Griffin	Roswell ,GA
Federal Reserve Bank of Minneapolis	Minneapolis ,MN
Artisoft Inc.	Tucson ,AZ
Leading Edge Computer	Westborough ,MA
Bill Sorcinelli	Spokane ,WA
University of Minnesota	Twin Cities ,MN
Max Ule & Company	New York ,NY
Thomas Nelson/Clockwork Software	San Jose ,CA
Mike Stroud	Raleigh ,NC
Girard Westerberg	Littleton ,CO
Microrim Corporation	Redmond ,WA
Ben Husset	Minneapolis ,MN
Jim Faliveno/Monumental Computer App.	Cherry Valley ,NY
Mike James - Multimedia Software	Mount Airy ,MD
Navy Regional Data Automation Center	NAS Norfolk ,VA
Marshall Space Flight Center	Huntsville ,AL
Ben Cunningham	Nashville ,TN
US Department of Agriculture	Beltsville ,MD
National Genealogical Society	Arlington ,VA
National Inst. of Science and Technology	Gaithersburg ,MD
Ed Aborn	Tampa ,FL
Nautilus Communications	Iola ,KS
Dept. of Navy / Bill Walsh	Washinton, D.C. ,.
Network World Magazine/CW Communications	Framingham ,MA
Nat. Institute for Standards/Technology	Boulder ,CO
National Oceanographic/Atmospheric Admin	Boulder ,CO
The Mitchell Group	Laurel ,MD
US Department of Education	Washington ,D.C.
Dave Hughes	Colorado Springs ,CO
Gary Walsh/Tom Haavisto	Thunder Bay ,Ontario
Terry McCraith	Williamsville ,NY
Hayes Microcomputer Products	Norcross ,GA
Don Crago	Pooraka South Australia ,
Fran and Norm Saunders	Colesville ,MD
Gwyn Reedy/PacCom Inc.	Tampa ,FL
Norm Henke	Cleveland ,OH
Telenet Communications	Reston ,VA
Jim Toro	Hicksville ,NY
Univ.of Mass. Dept. of Physics/Astronomy	Amherst ,MA
Phil Katz/PKWare Incorporated	Glendale ,WI

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BOARDWATCH MAGAZINE

NATIONAL LIST OF ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - AUGUST 1990

SERVICE	PHONE	DESCRIPTION	SPONSOR/SYSOP	LOCATION
Pleasure Dome	(804)490-5878	. Sexually Explicit Fantasy Chat System - Adults only	Tom Terrific	Tidewater ,VA
Popular Mechanics Online BBS	(212)582-8369	. Automotive, Home/Shop, Electronics/Photography, Science	Popular Mechanics Magazine	New York ,NY
ProComm Support BBS	(314)474-8477	. Home of ProComm 2.4.3 and ProComm Plus Comm Prgrms	Thomas Smith/DataStorm Technologies Inc.	Columbia ,MO
Public Brand Software BBS	(317)856-2087	. Commerciai Shareware Vendor	Public Brand Software	Indianapolis ,IN
Radio Electronics BBS	(516)293-2283	. Radio Electronics Magazine Online Adjunct	Gernsback Publications	Farmingdale ,NY
Random Access Information Svc.	(503)761-8100	. 10500 IBM/MAC/AMIGA Files - 3000 MaxiPic Graphics	Janice Stevens	Portland ,OR
RGB Computing	(519)824-3997	. Multiline Information Service/PC Sales/Large File Selection.	Ronald Spencer - RGB Computing	Guelph ,Ontario
Rose Media	(416)733-2780	. Excellent Canadian PC Board System-Publications/Conferences	Vic Kass	Willowdale ,Ontario
Rusty & Edies	(216)726-0737	. Large ML PCBoard run by Husband and Wife - NFL/Tradewars	Rusty and Edwina Hardenburgh	Boardman ,OH
Salt Air BBS	(801)261-8976	. Home of PCBoard BBS Software - National List of PCB Sys	Clark Development Company/David Terry	Murray ,UT
Science Resource Studies BBS	(202)634-1764	. Federal R&D Budget - Technical Labor Market Statistics	National Science Foundation	Washington ,D.C.
Scooters Scientific Exchange	(215)657-5586	. Biotechnology/Chemistry/Physics/Astronomy/Space Sciences	Brian Moldover	Willow Grove ,PA
SEAboard!	(201)473-1991	. Support system for ARC, SEADOG, and AXE software.	System Enhancement Associates	Wayne ,NJ
Seagate Technical Support BBS	(408)438-8771	. Installation and Specifications for Hard Drive Models	Seagate/Shelley Toich	Scotts Valley ,CA
Sistema Profesional Informacion	525 590-5988	. . Largest BBS in Mexico - Spanish Language TBBS	Tecnologia Uno Cero S.A. de C.V.	Mexico City ,
Society for Technical Comm. BBS	(703)522-3299	. STC Job Service, Freelance Registry - Technical Writers	Society for Technical Communication	Washington ,D.C.
Sonshine Express BBS	(408)946-7362	. Family Oriented Christian BBS	Anton Johnson	Fremont ,CA
Sound Advice BBS	(816)436-4516	. Twenty Line PCBoard with 2 Gigabytes Storage - HST Modems	Roy Timberman	Gladstone ,MO
State and Local Emergency Mgmt.	(202)646-2887	. Hazardous Materials/National Dam Watch/Emergency Info	Federal Emergency Management Agency	Washington ,D.C.
Take 3 BBS	(602)482-1001	. Reviews of Movies/Videos/ Film Industry Job Clearinghouse	Dave Kidder	Scottsdale ,AZ
Talk Channel	(818)506-0620	. DLX-Based Multiline Chat/Talk Service - Sexual Orientation	Gary Clarkson	North Hollywood ,CA
TAXACOM	(716)896-7581	. Botany, Herbaria, FLORA ONLINE Newsletter, Latin Translation	Clinton Herbarium, Buffalo Museum	Buffalo ,NY
Taxonomic Reference File	(215)972-6759	. Online Bacterial Name Database - ORACLE Door	BIOSIS Carol Lock/Keith Pittman	Philadelphia ,PA
TBBS Net 104/23	(303)699-9248	. Home of The Bread Board System (TBBS) BBS Software	Phil Becker/eSoft Inc.	Aurora ,CO
Telegodzilla	(503)621-3746	. Home of ZModem File Transfer Protocol/YModem/YAM	Chuck Forsberg/Omen Technology Incorp.	Portland ,OR
Telix Support BBS	(416)439-8293	. Support Service for Telix Communications Software	Colin Sampaleanu/Exis Incorporated	West Hill ,Ontario
Texas State Law Library BBS	(512)463-1371	. Online Legal Periodicals and Citation Database		Austin ,TX
The Back Room	(718)849-1614	. America's Largest Exclusively Gay DB - Home of Gaycomm	Artie Kohn	Richmond Hill ,NY
The Business BBS	(213)477-0408	. Microsoft Windows Support	Jim Appleby	Los Angeles ,CA
The Ledge PCBoard	(818)352-3620	. Home of Textview Door for PCBoard Systems	Joseph Sheppard	Tujunga ,CA
The LiveWire BBS	(609)866-2551	. Online Magazine Subscription Orders/BBS Callers Digest	Richard Paquette	Mt. Laurel ,NJ
The Well	(415)332-7190	. Unix Conferencing System - $8 monthly plus $3 hourly	Whole Earth Lectronic Link	Sausalito ,CA
TurboTax Support BBS	(619)453-5232	. Income tax information - Turbotax 1040 program support	Chipsoft Inc.	San Diego ,CA
U.S. Robotics - Sit UBU Sit	(708)982-5092	. Support for US Robotics HST 9600 bps Modems	U.S. Robotics Corporation	Skokie ,IL
Unitex Communications BBS	(201)678-1367	. United Nations Press Releases - Unitex News	Dr. James Waldron	Glen Ridge ,NJ
US Naval Observatory BBS	(202)653-1079	. Time - Date - Sunrise - Sunset - Enter @TCO for Commands	US Department of Commerce US Naval Obser	Washington ,D.C.
USA Today Distribution Service	(303)973-4222	. Distribution Service for USA Today/Newsbytes/Boardwatch	Boardwatch Magazine	Littleton ,CO
USA/GDR Databank	(202)529-0140	. News from East Germany, Rumania, USSR, Czechoslovakia	Council on USA/German Democratic Repub.	Washington ,D.C.
USGS Quick Epicenter Determin.	(800)358-2663	. Earthquake Epicenter Data - Geomagnetism7E2	US Geological Survey Earthquake Info Cnt	Denver ,CO
USNO Time of Day for Clocks	(202)653-0351	. Xmits ASCII Time String - Sync Your PC to USNO Atomic Clock	US Dept. of Commerce US Naval Observ.	Washington ,D.C.
UT Library Online Catalog	(512)471-9420	. Online Library Card Catalog Listing 3.5 million entries	University of Texas at Austin	Austin ,TX
VA Property Listing BBS	(602)640-2371	. List of VA held property foreclosures	Veterans Admin - Phoenix Regional Office	Phoenix ,AZ
Vacation Florida Database	(407)839-0333	. Florida Tourism Information/Database of Campsites/Hotels	Richard and Barbara Kenney	Orlando ,FL
Ward and Randy's CBBS	(312)545-8086	. World's First and Oldest Micro-based BBS - Since 2/16/78	Ward Christensen/Randy Suess	Chicago ,IL
WeatherBank	(800)827-2727	. Online Weather Forecasts for Any City - Download Radar Data	Steve Root/WeatherBrief Data Services	Salt Lake City ,UT
Western Digital Tech Support	(714)756-8176	. Hard Drive/Controller Installation and Config Data	Western Digital Corporation	,
Windsor Manor	(203)688-4973	. Over 27 Online Adventure Games	Jim Taylor	Windsor ,CT
Word Perfect Customer Support	(801)225-4444	. Word Perfect 4.2/5.0/5.1 Support/Printer Drivers	Word Perfect Corporation	Orem ,UT
XyQuest Support BBS	(508)667-5669	. Support for XyWrite Word Processor - Custom Keyboard Files	XyQuest Inc. - Christine Madsen	Bellerica ,MA
Ye Olde Bailey	(713)520-1569	. Legal Issues Regarding RBOC Relations with Info Services	Reginald Hirsch; Attorney	Houston ,TX
Zenith Technical Support BBS	(800)888-3058	. Technical Support for Zenith Desktop and Laptop Units	Zenith Data Systems Customer Service	Chicago ,IL

BOARDWATCH MAGAZINE
Classified Electronic Bulletin Board Advertisements

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Bruce's Bar & Grill 203-236-3761 West Hartford Connecticutt since 0883. Sysop: Bruce Lomasky. Using TBBS 2.1M via 24 lines on MS-DOS 80386 computer with 300 MB storage. U.S. Robotics at 14400 bps. Fee:$ None. Bruce's Bar and Grill has a similar atmosphere to TV's "Cheers". Public, Private, and Over 21 Conference Sections. Many regulars stop by and chat each day. Many online games (some multiuser real time) and thousands of IBM files.

General Information Systems (GeniSys) 215-887-6600 Philadelphia, Pennsylvania since 0489. Sysop: Robert Malerman. Using Galacticomm 5.10 via 15 lines on MS-DOS 80286 computer with 80 MB storage. Supra at 2400 bps. Fee:$.36 Hourly. Hot - Exciting - Multi Line Chat service! User registry, Multi Player Games!, Special Interest Groups, and Much Much more! Call today for fast paced action. Starlink node 9581. PC Persuit node PHLPA. GeniSys-When your modem deserves the VERY BEST!

PC-OHIO PCBOARD 216-381-3320 Cleveland, Ohio since 0985. Sysop: Norm Henke. Using PCBoard 14.5/U via 9 lines on MS-DOS 80386 computer with 1980 MB storage. U.S. Robotics at 9600 bps. Fee:$30 Annually. The Best BBS in America. Over 20000 ZIP files on-line. Each node a dedicated 286 or 386SX computer. Large Adult file section. ProDoor, ProBank, MegaMail and MarkMail doors. Free access for members of ASP. Call 216-381-2115 for USR HST DS.

Chicago Syslink TBBS 312-622-4442 Chicago, Illinois since 0681. Sysop: George Matyaszek. Using TBBS 2.1M via 4 lines on MS-DOS 80386 computer with 80 MB storage. Multitech at 2400 bps. Fee:$20 Annually. Multi-Purpose System Catering To All Pet/Ferret Owners. Online Chat Mode, Games, Magazines, National Echo Conferences, MicroMatch/Find A Friend, Voted as #1 BBS for IL. & #20 for USA. Call ANYTIME and have some FUN for a change!

The INDEX System TBBS 404-951-1540 Atlanta Georgia since 0484. Sysop: Rodney A. Aloia. Using TBBS 2.1M via 3 lines on MS-DOS 80386 computer with 120 MB storage. Hayes at 9600 bps. Fee:$. Largest CoCo BBS in the Southeast, also a SDNet/Works! Member. Home of "Today/TDBS", "The Online Catalog", and other TEBS/TBBS applications. USA Today News. Both Hayes Ultra 9600 and US Robotics HST nodes.

Data Point! 501-442-8777 Fayetteville, Arkansas since 0183. Sysop: Gary W Funk. Using TBBS 2.1M via 4 lines on MS-DOS 80286 computer with 260 MB storage. U.S. Robotics at 9600 bps. Fee:$30 Annually. Data Point! has multi-line chatting, on-line publications, and multi-player games. Large library of SDN, SDS, and TDN files. Support for MS-DOS, Commodore, and Amiga. TBBS/TDBS/TIMS and TMail support. NetWork, FidoNet, and UUCP message areas.

Medical Software Exchange 507-281-1989 Rochester, Minnesota since 0888. Sysop: Richard Kaplan, M.D.. Using OPUS 1.03 via 1 lines on MS-DOS 80286 computer with 300 MB storage. U.S. Robotics at 14400 bps. Fee:$29 Annually. Extensive collection of public domain medical software and messaging

Cul-de-Sac Bar & Grill 508-429-1784 Holliston, MA since 0385. Sysop: Pete White. Using TBBS 2.1M via 5 lines on MS-DOS 80286 computer with 380 MB storage. U.S. Robotics at 14400 bps. Fee:$45.00 Annually. The home of many TBBS/TDBS software packages, and an almost continuous beta site for many TBBS/TDBS software authors. Like Ben Cunningham's 10,000 message system with full screen editing and quoting, and Jeff Johnsons On-Line Sales Manager.

The Livewire BBS 609-866-2551 Mt. Laurel, New Jersey since 0889. Sysop: Richard Paquette. Using PCBoard 14.E via 3 lines on MS-DOS 80286 computer with 400 MB storage. U.S. Robotics at 14400 bps. Fee:$. Features the LiveStore with 20+ Product Departments for On-Line ordering with Visa/MC. Home of: BBS Caller's Digest, The LiveStore, Discount Magazine Door. Boardwatch, USA Today, Info-Mat, Zip Beep and Business Sense. 80+ Doors, Games, Conferences.

GLIB - Gay & Lesbian Information Bureau 703-578-4542 Washington, DC since 0686. Sysop: Jon Larimore. Using TBBS 2.1M via 15 lines on MS-DOS 80386 computer with 720 MB storage. U.S. Robotics at 14400 bps. Fee:$35 Annually. GayWay To Your World. Free to members of gay community groups. GayCom National Network. Computer SIGS, ShareWare, current news, info files, support services. Live real-time chat. PC Pursuitable. StarLinkable.

Micro Message Service (MMS) 919-779-6674 Raleigh, North Carolina since 1082. Sysop: Michael M. Stroud. Using TBBS 2.1M via 7 lines on MS-DOS 80386 computer with 1400 MB storage. U.S. Robotics at 9600 bps. Fee:$35 Annually. MMS support IBM PC, Amiga, Macintosh, Atari ST, Apple and other SIGs. Online multi-user games. Largest software collection on east coast with 1.4 Gigabytes of storage.

DENVER PC BOARDWATCH

LIST OF AREA CODE 303 ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - AUGUST 1990

TITLE	PHONE	DESCRIPTION	TYPE	MODEM	SOFT	CITY	OPERATOR
Adelante 104/93	443-8292	Central/Latin America News/Issues	IBM	2400	Opus	Boulder	Zhahai Stewart
Alpha BBS/Intercomex	375-8231	Enter ALPHA - Ham Radio/Space Topics	Unix Mini	1200	UNaXcess	Denver	Cyro Lord/Robert Brumley
APSNet	693-6737	Aurora Public Schools Network	Apple	2400	GBBS	Aurora	Columbia Middle School
Boardwatch Magazine 104/555	973-4222	Back Issue Index, Dialing Directories	IBM	2400	TBBS	Littleton	Jack Rickard
Byte Shop 104/311	794-5065	Jokes/Good Echomail/Downloads	IBM	96HST	QuickBBS	Littleton	Dan O'neal
C.A.C.H.E	745-4960	CO Apple & Compatible Home Enthusiasts	Apple	2400	GBBS	Denver	Gary Edwards
C.A.R.L.	863-1350	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	C.A.R.L.
C.D. Players	825-0419	Computer Discount On-line Store/Amiga	Amiga	2400	TBBS	Denver	Jay Tompkins
Chatfield Armory	972-9023	Firearms for Sale/Trade - Online Games	IBM	2400	QuickBBS	Littleton	Dave Bell
Chidvilas 104/207	449-7399	Bhagwan Shree Rajneesh followers	IBM	96PEP	Opus	Louisville	Terry Mooster
Circuit Board, The 104/117	666-0302	Electronic Professionals and Enthusiasts	IBM	96HST	QuickBBS	Lafayette	Jack Dean/Kevin Vaden
CMOS-CO Mtn Operating Systems	322-4078	Serving Amiga and MS-DOS	IBM	96V.32	RemoteAc	Denver	Kevin Truitt
CO State Judicial BBS 104/420	831-1704	Colorado State Judicial ADP Department	IBM	2400	QuickBBS	Denver	Scott V. Hopta
College Board, The	979-7299	Red Rocks College Bulletins/Schedules	IBM	1200	TOS	Littleton	Tom Nielson
Colorado Broadcasters 104/42	341-0129	Commercial Radio Frequency Lists	IBM	1200	Opus	Aurora	Jeff Brothers
Comm-Post, The 104/666	534-4646	Astronomy -725+MB of Files - Multiline	IBM	96HSTV32	TBBS	Denver	Brian Bartee
ComNet BBS	972-8340	On-line BASIC Teaching, Files, More!	IBM	2400	QuickBBS	Littleton	Dave Lange
Computer Care BBS 104/41	771-8107	PC Magazine/Tech Journal Files	IBM	2400	Opus	Littleton	John Bilbro
Control Systems 104/417	458-6248	IBM/Compatibles Subscription Board	IBM	96MICROC	RBBS	Denver	Lupe Ramiriz
CP/M SIG INC 104/372	465-1313	Oldest User's Group in Area - CP/M - IBM	IBM	2400	Fido	Broomfield	Al Lundquist
Craig's Place	288-1463	PC Nationals Drag Racing/Chess/Games	IBM	2400		Denver	Craig Steele
Crypt, The	696-9084	Adult Messages and Activities	IBM	2400	WWIV	Denver	Bill Bonic
D-Link 1 104/411	936-2791	Golden Micro Computer Sales/Support	IBM	96HST	QuickBBS	Denver	Bob Wells
Dark Crystal, The 104/421	654-1278	Role Playing Games	IBM	2400	QuickBBS	Denver	Steve Boyd
Dementia	986-9610	American MENSA Denver Chapter	Apple	96HST	GBBS	Lakewood	Chuck Pelto
Denver Area R:BASE Users Group	422-2149	R:BASE Information PC Related Files	IBM	2400	QuickBBS	Lakewood	Paul Fullerton
Denver Deaf-Net	989-9245	Hearing Impaired/Computing	IBM	2400	QuickBBS	Lakewood	David Sheneman
Dinosaur Board 104/114	1-652-3595	TRS80 Support/16 Online Adventure Games	IBM	96HSTV32	TBBS	Niwot	Chris Anderson
Discordian Society	933-3472	Disagreeable Conversation		2400			Steven Crandall
Dragonfriends Place 104/11	782-9547	Wicca/Astrology/Tarot/Pagan Interests	IBM	2400	Opus	Denver	Russ Anderson
Eagle's Nest 104/315	933-0701	Many Files and Echoes	IBM	9600	QuickBBS	Littleton	Ronald Olsen
Emerald City BBS 104/214	427-1471	Electronics Discount World	IBM	2400	QuickBBS	Westminster	Daniel Osborn
Enterprise	377-1005	Local Radio Freq List - Star Trek Theme	Apple	2400	Protree	Denver	Jeff Tensly
eSoft TBBS Software Support	699-9248	The Bread Board System-LOGON:ANSI DEMO	IBM	96HST	TBBS	Aurora	Phil Becker
Fantasy Mountain 104/809	278-8369	Deaf and Handicapped Issues ASCII TTY	IBM	2400	QuickBBS	Golden	Steve Shockley
Four Wheeling BBS, The	469-4954	Jeeping / Camping / Outdoors	Atari	2400	STadel	Broomfield	John Ferguson
Fred's BBS	233-1316	Over 1300 Adult Files	IBM	2400	QuickBBS	Lakewood	Fred Schupner
Free Information Exch. 104/89	699-1516	Programming - Home and Garden	IBM	2400	Opus	Denver	Charles Frnka
Front Range BBS 104/213	465-5447	Front Range Software Services	IBM	2400	QuickBBS	Broomfield	Gary Jones
Front Range PC Users Group BBS	1-223-2252	Fort Collins Group - Computer Express	IBM	2400	Wildcat	Fort Collins	Tom Oppenheimer
FutureWave BBS 104/57	440-7425	Games / C Language / MIDI	IBM	2400	Opus	Boulder	
Galaxy Express Three-Nines	673-9978	Japanese Cartoon Animation-Messages	IBM	2400	QuickBBS	Broomfield	Mark Medrud
Gay Community Fido 104/19	795-1215	Messages / Downloads for Homosexuals	IBM	1200	QuickBBS	Littleton	Witheld by Request
GDP Technologies BBS	673-9470	Outstanding IBM Shareware/Programming	IBM	2400	Wildcat	Lafayette	Tom Gettys
Grotto, The	694-9050	Amiga, Pascal - Ebert Personal Computers	IBM	2400	TBBS	Aurora	Vincent Veritas
HawkNet	696-3808	Prairie Middle School	Apple	2400	GBBS		Doyle Oswald
Home BBS, The 104/419	428-1185	Recipes/Cooking Theme	IBM	2400	QuickBBS	Denver	Richard Harper
HP Haven 104/312	671-5976	Tradewars/On-line Games/ 5PM-7:30 AM	IBM	96HST	QuickBBS	Westminster	Mark Willecke
King's Market Bookshop 104/115	665-6091	Books, Writers, On-line Adventure Games	IBM	96HST	TBBS	Boulder	Jim Burt
L&L Support	420-3568	Primary GBBS Pro Software Support BBS	Apple	2400	GBBS	Arvada	Lance Taylor-Warren
Lakewood Department of Safety	987-7388	Police Sponsored - Law Enforcement Msgs	IBM	1200	RBBS	Wheatridge	Larry Scheideman
LaserWriting Desktop Service	741-4122	Laser Printing/Scanning/Linotronic 300	MAC	1200	RedRyder	Denver	Bill Wright
LDS Reading Room, The 104/513	343-1665	Latter Day Saints - The Mormons	IBM	2400	QuickBBS	Aurora	Don Bell
Lensman, The	979-8953	Science Fiction/Fantasy Fandom News/Info	IBM	2400	GT Power	Littleton	Greg Bradt

LES-COM-net	526-2046
Lodge, The 104/212	420-0305
MACE 104/416	797-8090
Master Control 104/325	949-3253
Max Manlove's BBS	863-8110
MICRO	752-2943
Microlink B 104/108	972-9600
Microlink D 104/711	237-8575
Microlink Minus Two 104/204	753-9710
Middle Earth BBS	341-9521
Midrash 104/18	289-6864
Mile High BBS	733-1340
Mile High Mac Meet	758-9159
Mile High Net	671-7308
Mohave Net Gateway 104/62	426-0623
Monkey Boy BBS 104/43	469-7161
Mountain Man TI	797-6783
NBS Automated Computer Time	494-4775
NetComm BBS	730-6709
New Age Bulletin Board, The	366-1106
NightFlyer 104/210	467-9199
Ninth Portal, The	470-0304
Nurse Link 104/52	270-4936
OKY BBS 104/113	494-0533
On-Line Consulting 104/45	449-5251
On-Line Shopping Service	442-5125
PCIS 104/904	789-4610
Pentax Support	460-1637
Pinecliffe 104/28	642-7463
Pink Flamingo 104/607	497-3934
Professional System, The	740-2223
Quick Epicenter Determination	279-6374
R.A.B.B.I.T.	757-9509
Ready Room, The 104/424	329-8136
Realtime Control & Forth Board	278-0364
Regency Datasource 104/58	972-1222
RIBBS Support Hdqrtrs. 104/54	343-6707
Rocky Mtn Info Exch 104/739	841-9570
Ron and Shannons BBS	978-0298
Short Line 104/36	778-7312
SnarfQuest V 104/317	973-0625
Sound Doctrine BBS 104/514	680-7209
Sounding Board	444-7942
Space Environment Service Cntr	497-5000
Space Network	494-8446
Steamboat Information	1-879-6741
Stonewall 104/112	499-2676
TBBS Net 104/23	699-9248
The 8th Dimension 104/118	651-7745
The 8th Sea 104/610	252-9235
The Oak Tree	431-7522
This End Up 104/30	429-2445
Translations Unlimited	988-5765
U.S.S. Liberty 104/432	757-6197
Vet Set, The	690-3218
Watchdesk, The 104/66	450-0822
Weyr, The 104/211	429-2975
Wizardry 104/630	670-1416
World Peace BBS 104/415	320-4822

Lesley College Comm Net - GBBS Multiline	Apple	2400
Arvada Quick BBS Board	IBM	2400
MS-DOS User Group - Many Files/Echoes	IBM	2400
Radio Broadcast Engineers/Technicians	IBM	Hayes96
Gay and Lesbian Issues and Discussion	IBM	2400
Mile High Computer Resource Organization	IBM	2400
1 GB Files-USA Today-Multiline- 104 NC	IBM	96HSTV32
Over 200 MB - Doesn't Break	IBM	96HST
Professional Comp. Sales Inc./Astronomy	IBM	2400
Chess/Scrabble/Startrek/Barons	IBM	2400
Messianic Judaism - Religious/Philosophy	IBM	96HST
Triathalons - Race Schedules - Fitness	IBM	2400
Denver Macintosh Users Group	MAC	96HST
Fido Board	IBM	2400
Science Fiction/Medical Echo	IBM	96HST
Smileware Software	IBM	2400
Denver TI Users Group - Texas Instrument	TI	2400
ACTS - Sync PC Clock to NBS Atomic Clock	Custom	1200
Weather - Online Games - 330 MB	IBM	2400
Health, Ecology, Philosophy	IBM	1200
Basic/dBase/Assembler/C Programming	IBM	2400
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Armenian Electronics Consultant	IBM	2400
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Writers, Lawyers, EDP Auditors	IBM	1200
USGS Earthquake Data 7E2	VAX	300 7E2
Colorado Highway Department - Planning	IBM	1200
Star Trek Theme - USS Tutakai NCC-1799-B	IBM	2400
Vesta Technology/Denver Forth Int. Group	IBM	2400
Private Computer Consulting Support	IBM	96Hayes
Support for CoCo RIBBS Software	IBM	2400
Multiline Adults/Chat/Game/DL/Messages	IBM	96HSTV32
Atari Support 5.4 MB XE 130	Atari	2400
Varied Topics, Fidonet, BinkleyTerm	IBM	96HSTV32
The Tower	IBM	2400
Christian BBS / Sound Doctrine Church	IBM	2400
Desktop Publishing/Image Files	IBM	2400
NOAA Solar Flare Forecast / Advisory	IBM	1200
Space Exploration Information	IBM	2400
Info on Steamboat Springs Area	IBM	1200
Online Games/Graphics 120 MB	IBM	96HST
T)he B)read B)oard S)ystem Support	IBM	2400
	IBM	24
Wiccan, Scuba issues	IBM	2400
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Language Translation 6PM-6AM	IBM	2400
Naval Them CVN 6809	Coco	2400
Veterans Issues	IBM	2400
Safety - Arson - Hazardous Material	IBM	96HST
Good Collection of Game Software	IBM	96HST
210 MB Files Online Games Echomail	IBM	96HST
Current Events, Politics, Religion	IBM	2400

GBBS	Genesee	George Willett
QuickBBS	Arvada	Harold "Monty" Montrose
QuickBBS	Denver	Kevin Payne
Opus	Denver	Lynn Osburn
RBBS-PC	Denver	Max Manlove (pseudo)
QuickBBS	Westminster	Jim Kochmann
TBBS	Littleton	Girard Westerberg
TBBS	Lakewood	???
TBBS	Denver	Paul Smith
QuickBBS	Denver	Christopher Millensifer
QuickBBS	Denver	Daniel Segard
RBBS	Denver	Bill Ankele
WWIV	Denver	Jon Taylor
Fido	Aurora	Dave Miller
QuickBBS	Denver	Claude Warren
Opus	Broomfield	Todd Hill
Tigger	Littleton	Roy Bartee
Custom	Boulder	Natl. Bureau of Standards
GT Power	Littleton	Bill Watts
TBBS	Aurora	Hal/Fran Piser
QuickBBS	Arvada	Marcel Madonna
Skyline	Highlands Ranch	Rick Henderson
TBBS	Littleton	Larry McNeill
QuickBBS	Boulder	Onnig Kouyoumdjian
Opus	Estes Park	Lee Lasson
Chairman	Boulder	Pete Dempsey
Opus	Englewood	Phil Kaiser
TBBS	Broomfield	Chris Anderson
Opus	Pinecliffe	Craig Baker
QuickBBS	Boulder	Cathy Nicolleti
TBBS	Littleton	Bob Voorhees
????	????	Bruce Presgrave
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TBBS	Parker	Larry Kayser
OASIS	Englewood	Ron/Shannon Sellers
TBBS	Denver	Alan Applegate
QuickBBS	Littleton	Radford Walker
TBBS	Aurora	Tim Williams
Wildcat	Boulder	Pat Nefos
PBBS	Boulder	US Dept of Commerce
TBBS	Boulder	Tom Meyer
TBBS	Steamboat Springs	???
QuickBBS	Boulder	Mike Reetz
TBBS	Aurora	Phil Becker/eSoft Inc.
Opus	Longmont	Brian Godette
QuickBBS	Northglenn	Rod Lamping
RBBS-PC	Arvada	Denise Beahm
Opus	Westminster	Steve Carnes
Minihost	Lakewood	Jon Johnson
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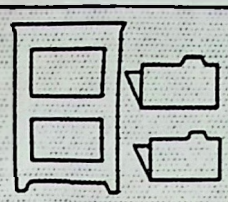

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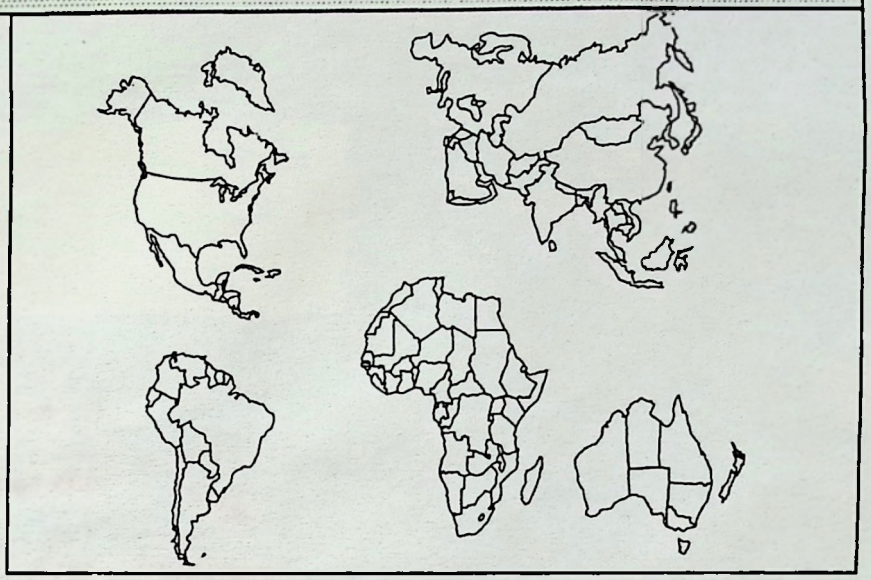

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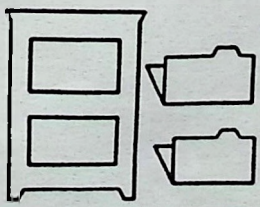

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